ID: R-2633B

CONTRACT: C203198

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NOTE: SEE SHEET 2B FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

STATE PROJECT 34491.1.2 I.D. NO. R-2633B

F.A. PROJECT STPNHF-17(1)

COUNTY BRUNSWICK/NEW HANOVER

PROJECT DESCRIPTION US 17 (WILMINGTON BYPASS)

FROM EAST OF US 74/76 IN BRUNSWICK CO. TO

US 421 NORTH OF WILMINGTON IN NEW HANOVER CO.

INVENTORY REPORT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633BB	1	399

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34491.1.2	STPNHF-17(1)	P.E.
34491.2.3		R/W
34491.3.21	NHS-0017(125)	CONST.

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT ☎ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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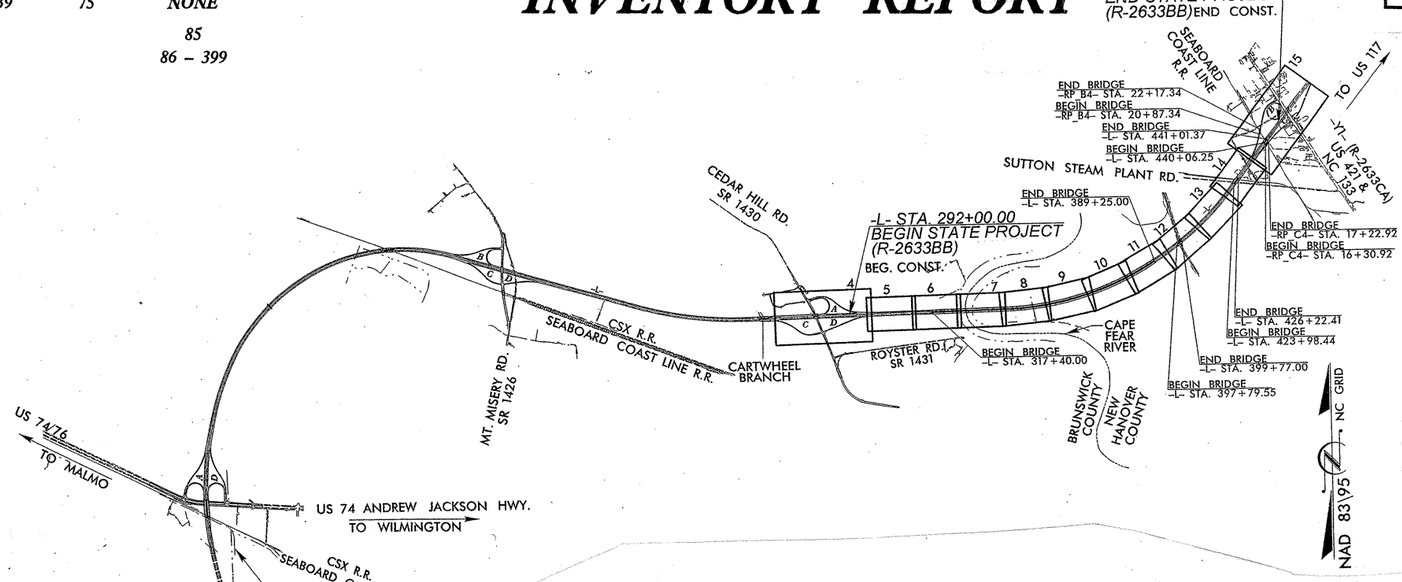
This inventory is for R-2633B, which includes R-2633BA and R-2633BB. Please refer to the respective portions for your needs.

-L- STA. 447+24.07
END STATE PROJECT
(R-2633BB) END CONST.



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INVESTIGATED BY S&ME, INC.

CHECKED BY A.F. RIGGS, JR.

SUBMITTED BY S&ME, INC.

DATE FEBRUARY 25, 2008

DRAWN BY: T. PEREZ

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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA LICENSED GEOLOGIST SEAL 1753 2/27/08 J. SHANE JOHNSON SEAL

SIGNATURE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14155 2/27/08 ABNER F. RIGGS, JR. SEAL

SIGNATURE

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
R-2633B	34491.1.2	2	399

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL								A-7-5, A-7-6						
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 : P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12"	3"				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL - LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL - PLASTIC LIMIT		
OM - OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW - PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
- SPRING OR SEEPAGE
- HC - HOLE CAVED

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 - DIP/DIP DIRECTION OF ROCK STRUCTURES
- WATER SUPPLY WELL
- SPT, CPT, DPT, DMT, VST, PMT - TEST BORING
- CPT TEST BORING
- GEO-PROBE
- AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION

SAMPLE DESIGNATIONS
- S- BULK SAMPLE
- SS- SPLIT SPOON SAMPLE
- ST- SHELBY TUBE SAMPLE
- RS- ROCK SAMPLE
- RT- RECOMPACTED TRIAXIAL SAMPLE
- CBR - CBR SAMPLE
- SPT N-VALUE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST
HVS - HAND VANE SHEAR

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] MOBILE B- 57
- [ ] BK-51
- [ ] CME-550x
- [ ] CME-750
- [ ] PORTABLE HOIST
- [X] OTHER ATV CPT RIG
- [X] OTHER TRACK CPT RIG

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [X] TRICONE 2-7/8 " STEEL TEETH
- [ ] TRICONE _____ " TUNG.-CARB.
- [ ] CORE BIT
- [X] OTHER 3-1/4" H.S.A.
- [ ] OTHER _____

HAMMER TYPE:
- [ ] AUTOMATIC
- [X] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [X] VANE SHEAR TEST
- [X] OTHER STEEL PROBE ROD

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGISTS PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

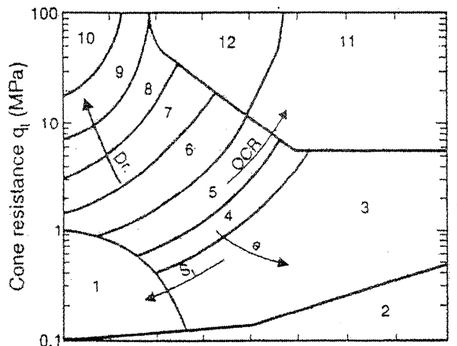
ELEVATION:

NOTES: COLLAR ELEVATIONS WERE OBTAINED FROM PROFILE SHEETS PROVIDED BY NCDOT.

REVISED 09/15/00

CPT Soil Profiling and Classification [1]

Soil samples are not recovered during CPT testing; however, it is possible to obtain an approximate soil classification using from cone resistance q_c and friction ratio R_f. Literature has shown that q_c is relatively high in sands and low in clays. Further, R_f is relatively low sands and high in clays. Soil types based on CPT results are usually referred to as soil behavior type (SBT). Soil classification charts have been adapted and improved based on expanded databases. One of the most commonly used behavior type charts, Figure 1, is suggested by Robertson (1986). Using q_c and R_f, this chart gives reasonable predictions of soil behavior up to 60 feet in depth.



Zone	Soil behaviour type
1	*Sensitive fine grained*
2	*Organic material*
3	*Clay*
4	*Silty Clay to clay*
5	*Clayey silt to silty clay*
6	*Sandy silt to clayey silt*
7	*Silty sand to sandy silt*
8	*Sand to silty sand*
9	*Sand*
10	*Gravelly sand to sand*
11	*Very stiff fine grained**
12	*Sand to clayey sand**

* *Overconsolidated or cemented*

Figure 1: Soil behavior type classification chart (after Robertson, 1986)

Since both penetration resistance and sleeve friction increase with depth due to the increase of effective overburden stress (σ_{vo}), CPT data requires correction (normalization). Robertson (1990) developed a normalized CPT soil behavior chart, Figure 2, using normalized friction ratio, R_f, and normalized cone resistance, Q_t.

$$F_r = \left[f_{sc}/\left(q_c - \sigma_{v_0}\right)\right]\times 100 \qquad Q_t = \left(q_c - \sigma_{v_0}\right)/\sigma'_{v_0}$$

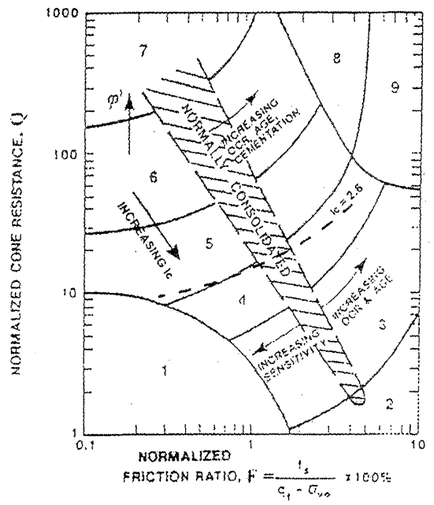
The Equivalent Soil Description for the CPT boring logs were based on correlations with the above soil behavior type classification chart using CPT data. The soils obtained from adjacent SPT soil test borings, performed by others, were visually classified and verified in the laboratory using the AASHTO soil classification system. These were correlated with the CPT data and presented on the CPT boring logs and cross sections.

---

[1] Jefferies, M. G. and Davies M. P. (1993), "Use of CPT to Estimate Equivalent SPT N_{60}", Geotechnical Testing Journal , Philadelphia, Pennsylvania.

Robertson, P. K. (1989) "Soil Classification using Cone Penetration Test", Canadian Geotechnical Journal, Edmonton, Alberta.

Robertson, P. K. (1998) "Cone Penetration Testing for Geotechnical and Environmental Site Investigation", ConeTec Inc.



Zone	Soil Behaviour Type	I_c
1	*Sensitive, fine grained*	N/A
2	*Organic soils – peats*	> 3.6
3	*Clays – silty clay to clay*	2.95 – 3.6
4	*Silt mixtures – clayey silt to silty clay*	2.60 – 2.95
5	*Sand mixtures – silty sand to sandy silt*	2.05 – 2.6
6	*Sands – clean sand to silty sand*	1.31 – 2.05
7	*Gravelly sand to dense sand*	< 1.31
8	*Very stiff sand to clayey sand**	N/A
9	*Very stiff, fine grained**	N/A

* *Heavily overconsolidated or cemented*

Figure 2: Normalized soil behavior type classification chart (after Robertson, 1990)

Note the charts are based on a broad sampling and are not regionally specific. Overlap in some zones should be expected and adjusted based on local experience.

Proposed by Jeffries and Davies (1993), the following equation combines the normalized cone parameters into a soil behavior type index, I_c.

$$I_c = \left(\left(3.47 - \log Q_T\right)^2 + \left(\log F_r + 1.22\right)^2\right)^{0.5}$$

Collecting additional parameters such as the pore water pressure during testing improves soil classification.

Correlation between CPT Data and SPT N_{60}

Standard penetration test (SPT) N-values can be correlated to CPT cone penetration resistance, q_c. The following equation was developed by Jeffries and Davies (1993):

$$\frac{\left(q_c/P_a\right)}{N_{60}} = 8.5\left(1 - \frac{I_c}{4.6}\right)$$

Where I_c is the aforementioned soil behavior type index and q_c is normalized by P_a (atmospheric pressure). Corrections for the grain size influence are included in the equation.

TIP PROJECT: R-2633B

CONTRACT:

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

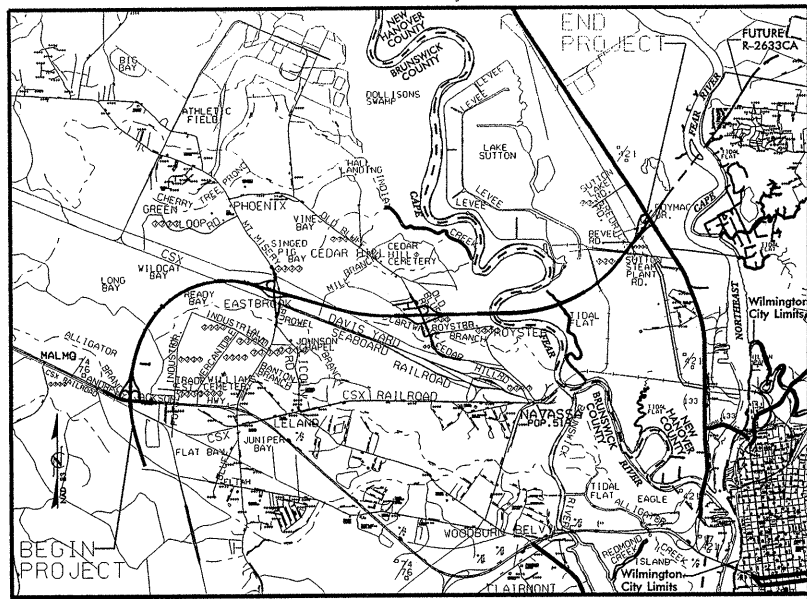
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2633B	2B	399
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34491.1.2	STPNHF-17(1)	P.E.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK & NEW HANOVER COUNTIES

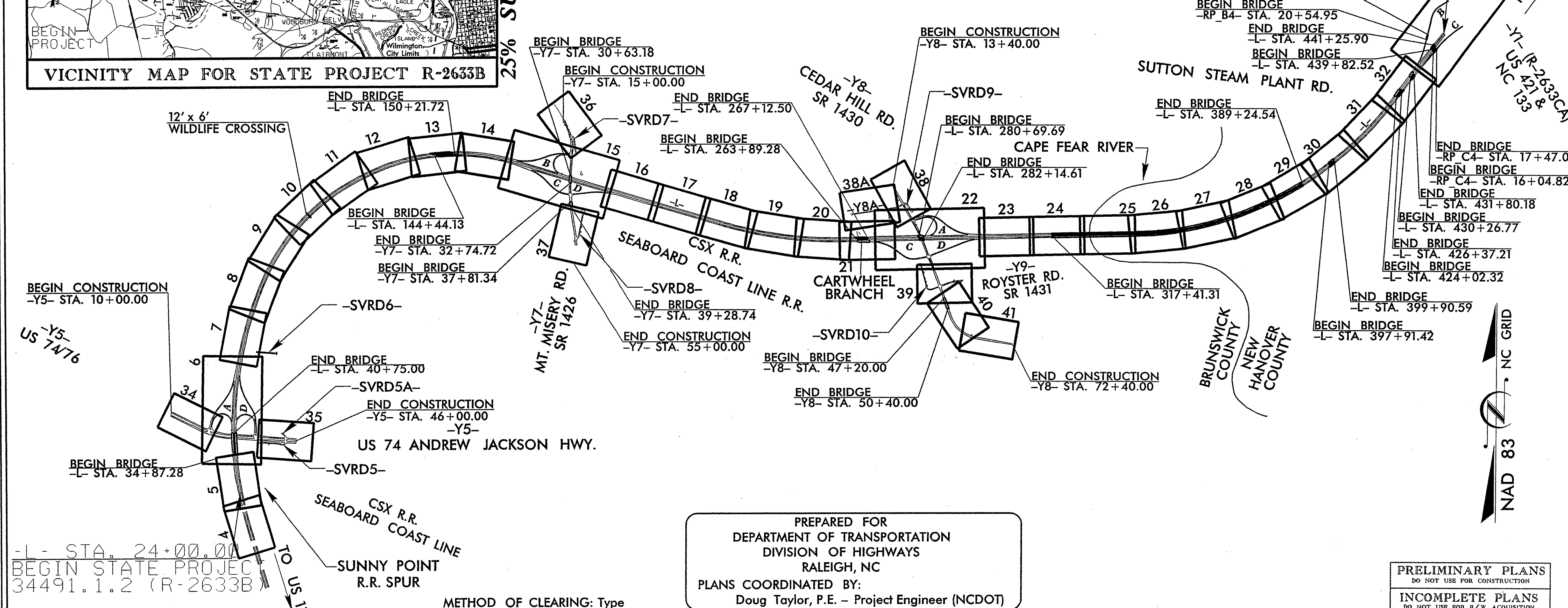
LOCATION: US 17 (WILMINGTON BYPASS) FROM EAST OF US 74/76 IN BRUNSWICK COUNTY TO US 421 NORTH OF WILMINGTON IN NEW HANOVER COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS SIGNALS, AND STRUCTURES



VICINITY MAP FOR STATE PROJECT R-2633B

25% SUBMITTAL



METHOD OF CLEARING: Type ____

PREPARED FOR
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC
PLANS COORDINATED BY:
Doug Taylor, P.E. – Project Engineer (NCDOT)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

GRAPHIC SCALES

50' 25' 0 50' 100' — PLANS

50' 25' 0 50' 100' — PROFILE (HORIZONTAL)

10' 5' 0 10' 20' — PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 16,400
ADT 2025 = 24,900
DHV = 12 %
D = 60 %
T = 15 % *
V = 70 MPH
* TTST 10% DUAL 5%
FUNC. CLASS. = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2633B = 6.16 Miles
LENGTH STRUCTURES TIP PROJECT R-2633B = 1.82 Miles
TOTAL LENGTH STATE TIP PROJECT R-2633B = 7.98 Miles

THIS IS A FULL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

Prepared In the Office of:
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: June 15, 2007 — Brian K. Eason, P.E. PROJECT ENGINEER

LETTING DATE: June 16, 2009 — Jeffrey R. Hext PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: ____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: ____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER ____ P.E.

$$$$$$SYSTIME$$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STATE PROJECT: 34491.1.2
FEDERAL PROJECT: STPNHF-17(1)
TIP NUMBER: R-2633B
COUNTY: Brunswick / New Hanover

DESCRIPTION: US 17 (Wilmington Bypass) from US 74/76 east of Malmo in Brunswick County to US 421 north of Wilmington in New Hanover County

SUBJECT: Roadway Subsurface Investigation – Inventory Report

Project Description

This project is located in northeastern Brunswick County and northwestern New Hanover County and extends from south of US 74/76 just west of its intersection with Enterprise Drive in Brunswick County to the existing Highway 17 Bypass at US 421 north of Wilmington in New Hanover County. The project will begin south of US 74/76 and extend north over the CSX railroad and US 74/76, continue north and east across the CSX railroad, continue east across Mt. Misery Road, continue east across Cedar Hill Road, continue east across the Cape Fear River, continue northeast across the CSX railroad, Sutton Steam Plant Road and two other railroads and connect to the existing Wilmington Bypass (Highway 17) at US 421 north of Wilmington, North Carolina. This project consists of a four-lane highway along 6.16 miles of new alignment, associated ramps and loops at four intersections (US 74/76, Mt. Misery Road, Cedar Hill Road and US 421), ten service roads, and 3.21 miles along existing alignments or realigning existing alignments (including seven –Y- lines). Mt. Misery Road will be realigned to the west of the existing Mt. Misery Road. There are fourteen bridge structures proposed for this project. Structures on –L- will be located over CSX railroad and US 74/76 (-Y5) (Station 34+87.28 to 40+75.00 –L-), over CSX railroad (Station 144+44.13 to 150+21.72 -L-), over Cartwheel Branch (263+89.28 to 267+12.50 –L-), over Cedar Hill Road (-Y8) (280+69.69 to 282+14.61 –L-), over the Cape Fear River (317+41.31 to 389+24.54 –L-), over a railroad (397+91.42 to 399+90.59-L-), over Suttons Steam Plant Road and a railroad (424+02.32 to 426+02.32 –L-), over Fredrickson Road (430+26.77 to 431+80.18 –L-) and over a railroad (439+82.52 to 441+25.90-L-). Structures on Mt. Misery Road (-Y7-) go over -L- (30+63.18 to 32+74.72-Y7-) and over CSX Railroad (37+81.32 to 39+28.74 –Y7-). The structure on Cedar Hill Road (-Y8-) goes of a creek (47+20.00 to 50+40.00 –Y8-). The structure on –RP_C4- crosses over a railroad (16+04.82 to 17+47.07 –RPC4-) and the structure on –RP_B4- crosses over a railroad (20+54.95 to 22+54.95 –RPB4-).

A geotechnical investigation was conducted between September 25, 2006 and January 9, 2007 using cone penetration testing and soil test borings. Three hundred and fourteen (314) cone penetration soundings were performed using an all-terrain direct push rig and a track direct push rig between September 25, 2006 and November 9, 2006. During the CPT soundings, eight pore water dissipation tests were performed at various borings and depths. Drilling was conducted between December 5, 2006 and January 9, 2007. Drilling consisted of advancing 3-1/4 inch diameter hollow stem augers with standard penetration tests at six (6) locations with a Mobile B-57 drill rig mounted on an all terrain vehicle. Sixteen Shelby tubes were pushed in the locations of the pore water dissipation tests. Two vane shear tests were performed at the same depths as the pore water dissipation tests in boring B-6, push (C-61).

In addition, several shallow hand augers borings were performed in low-lying wet areas across the project at several CPT locations to determine organic contents and shear strength properties of the upper soils. Hand vane shear tests were also performed at several locations in wet low-lying areas across the project. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the S&ME soil testing laboratory.

The following survey lines were investigated.

Line	Station		
-L-	24+00.00	to	445+28.39
-RP_A1-	10+00.00	to	30+04.11
-LP_A1-	10+00.00	to	22+55.13
-RP_D1-	10+00.00	to	32+04.37
-LP_D1-	10+00.00	to	23+67.72
-RP_B2-	10+00.00	to	29+91.64
-LP_B2-	10+00.00	to	21+34.89
-RP_C2-	10+00.00	to	26+56.89
-RP_D2-	10+00.00	to	24+32.22
-RP_C3-	10+00.00	to	30+27.42
-RP_D3-	10+00.00	to	26+60.30
-RP_A3-	10+00.00	to	31+55.71
-LP_A3-	10+00.00	to	23+38.68
-RP_B4-	10+00.00	to	33+41.66
-RP-C4-	10+00.00	to	27+05.63
-Y1-	34+77.68	to	55+11.79
-Y5-	10+00.00	to	46+00.00
-Y7-	10+00.00	to	55+00.00
-Y8-	13+40.00	to	72+40.00
-Y8A-	10+00.00	to	25+27.59
-Y8B-	10+00.00	to	22+50.00
-Y9-	10+00.00	to	16+50.00
-SVRD5-	10+00.00	to	18+38.53
-SVRD5A-	10+00.00	to	13+23.94
-SVRD9-	10+00.00	to	13+94.81
-SVRD10	10+00.00	to	20+97.15

Areas of Special Geotechnical Interest

1) Groundwater: Shallow groundwater conditions were encountered in portions of the entire project. The majority of the portion of the project south of the Cape Fear River was found to exhibit shallow groundwater conditions. Groundwater is present on or near the ground surface in the following areas

-L-	46+25	to	50+50
-L-	54+00	to	64+25
-L-	70+00	to	72+00
-L-	90+00	to	96+45
-L-	101+00	to	104+00
-L-	107+00	to	136+60
-L-	139+50	to	140+50
-L-	149+50	to	150+50
-L-	183+50	to	184+50
-L-	187+50	to	190+60
-L-	195+45	to	205+35
-L-	209+00	to	217+00
-L-	219+00	to	223+20
-L-	226+75	to	233+15
-L-	235+75	to	237+00
-L-	253+00	to	259+00
-L-	280+75	to	281+30
-L-	281+75	to	282+75
-L-	291+00	to	291+90
-L-	294+50	to	295+25
-L-	303+00	to	307+00
-L-	314+50	to	315+50
-L-	414+00	to	415+25
-LP_A1-	13+00	to	17+70
-LP_A1-	17+90	to	18+80
-RP_A1-	10+00	to	14+65
-RP_A1-	19+25	to	19+80
-RP_A1-	21+60	to	24+75
-RP_A1-	25+10	to	26+25
-LP_D1-	13+00	to	22+65
-RP_D1-	10+00	to	17+35
-RP_D1-	25+00	to	31+00
-RP_B2-	22+00	to	24+00
-RP_C2-	22+50	to	24+50
-RP_D2-	16+00	to	17+50
-RP_C3-	17+75	to	22+00
-RP_D3-	13+75	to	22+00
-LP_A3-	12+00	to	13+75
-RP_B4-	26+90	to	29+25
-Y7-	41+50	to	43+50
-Y8	13+40	to	18+50
-Y8-	20+00	to	32+50

Groundwater was found to be above or within 6 feet of the proposed grade.

Line	Station		
-RP_D1-	25+00	to	31+00
-LP_D1-	17+00	to	22+65
-LP_A1-	17+50	to	22+00
-RP_B2-	22+00	to	24+00
-RP_C3-	23+75	to	30+27.42
-LP_A3-	20+00	to	23+38.68
-RP_B4-	32+00	to	33+41.66
-Y8-	13+40	to	44+50
-Y8-	55+00	to	72+40
-SVRD9-	10+00	to	13+94.81

2) Highly Plastic Soils: No areas contain soils that have plasticity indices of 20 or higher within the upper 3 feet of grade within the proposed construction limits:

3) Organic or Loose /Soft Soils : The following areas contains relatively soft or loose, organic, wet soils which have the potential for subgrade problems during construction. In addition, these soils may contain cohesive or organic soils which may cause embankment stability or long term settlement problems.

Line	Station		
-L-	46+25	to	47+70
-L-	49+60	to	50+50
-L-	54+00	to	64+25
-L-	81+50	to	84+75
-L-	94+10	to	96+45
-L-	105+50	to	136+60
-L-	157+25	to	164+50
-L-	187+50	to	190+60
-L-	195+45	to	205+35
-L-	210+30	to	233+15
-L-	235+75	to	237+00
-LP_A1-	15+25	to	17+70
-LP_A1-	17+90	to	18+80
-RP_A1-	10+00	to	14+65
-RP_A1-	19+25	to	19+80
-RP_A1-	21+60	to	24+75
-RP_A1-	25+10	to	26+25
-LP_D1-	13+00	to	22+65
-RP_D1-	10+00	to	17+35
-RP_D1-	25+00	to	31+00
-Y7-	41+50	to	43+50

4) Water Wells: Water wells were located within the proposed construction limits at the following locations.

Line	Station	Offset
-L-	41+76	51 ft LT
-RP_B2-	26+82	36 ft LT
-RP_B2-	25+23	24 ft LT
-RP_B2-	29+09	31 ft LT
-L-	184+25	59 ft LT
-Y7-	33+37	118 ft LT
-RP_C2-	17+52	3 ft LT
-RP_C2-	19+90	130 ft LT
-RP_D2-	21+66	103 ft LT
-RP_C3-	29+58	5 ft RT
-Y8-	33+85	50 ft RT
-Y8-	35+57	56 ft RT
-L-	280+11	49 ft RT
-L-	431+54	30 ft RT
-L-	435+60	40 ft RT
-RP_C4-	15+04	240 ft RT
-RP_C4-	13+78	189 ft RT
-RP_B4-	14+81	111 ft LT

Physiography and Geology

The site is located within the lower eastern portion of the Coastal Plain Physiographic and Geologic Province of North Carolina in Brunswick and New Hanover Counties. The Coastal Plain Province is typically characterized by marine and eolian sediments that were deposited during the transgressive and regressive depositional sequences of the oceans moving into and out of North Carolina. As such, the Coastal Plain Province is characterized by subdued topographic features and flat, low-lying terrain. The geology of the north east quadrant of Brunswick County and the northwest quadrant of New Hanover County, near the project site, primarily consists of Undifferentiated Surface Deposits of Quaternary Age. In addition, loose, wet and organic soils common to pocosins are also present on this project. Typically, the Undifferentiated Deposits consist of sands with localized zones of fine-grained silts and clays. These deposits are underlain by the Peedee Formation of the Upper Cretaceous Age. The Peedee Formation consists of dark gray silts and clays interbedded with gray sand, calcareous sandstone, and limestone. Throughout most of New Hanover County, the Castle Hayne limestone of Middle and Upper Eocene Age typically lies between the undifferentiated surface deposits and the Peedee Formation. However, according to the "Geology and Groundwater Resources of New Hanover County, North Carolina, 1970" the Castle Hayne limestone appears to have been eroded and is not present within the northwest quadrant of New Hanover County in the vicinity of the project corridor.

Soils Properties

Soils present on this project are separated into three major categories based on origin. These categories include Undifferentiated Coastal Plain Deposits, roadway embankment fill soils and artificial fill soils.

Undifferentiated Coastal Plain deposits are the most prevalent soil type and are common to this physiographic region. A portion of the Undifferentiated Coastal Plain deposits encountered on this project consist loose/soft, wet, low-lying areas. The surficial soils in the low-lying areas predominately consist of very loose to medium dense brown, gray and black clayey and silty coarse to fine sand (A-3, A-2-4, A-2-5, A-2-6, A-2-7) with varying amounts of organic material including muck and very soft to soft gray, dark gray and black fine to coarse sandy silt (A-4, A-5) with varying amounts of organic material and very soft to soft dark gray moderately to highly organic silty coarse to fine sandy clay (A-7-5, A-7-6) and muck. The surficial sands have organic contents ranging from 1.2 to 12.9 percent. The surficial silts and clays have organic contents ranging from 1.3 to 25.2 percent. Hand held Vane Shear tests indicates undrained shear strengths ranging from 125 psf to 1337 psf and remolded strengths of 63 psf to 313 psf. The surficial silts and clays have low to moderate plasticity indices (1 to 17) and are below 20 for the entire project. Loose, wet, and organic containing soils are present within the construction limits in low-lying areas south of the Cape Fear River at the following locations:

Line	Station		
-L-	46+25	to	47+70
-L-	49+60	to	50+50
-L-	54+00	to	64+25
-L-	81+50	to	84+75
-L-	94+10	to	96+45
-L-	105+50	to	136+60
-L-	157+25	to	164+50
-L-	187+50	to	190+60
-L-	195+45	to	205+35
-L-	210+30	to	233+15
-L-	235+75	to	237+00
-LP_A1-	15+25	to	17+70
-LP_A1-	17+90	to	18+80
-RP_A1-	10+00	to	14+65
-RP_A1-	19+25	to	19+80
-RP_A1-	21+60	to	24+75
-RP_A1-	25+10	to	26+25
-LP_D1-	13+00	to	22+65
-RP_D1-	10+00	to	17+35
-RP_D1-	25+00	to	31+00
-Y7-	41+50	to	43+50

The wet, loose and organic sands and silts are slightly compressible while the wet, soft and organic clays are moderately compressible. Soils with high to moderate organic content are highly compressible.

Undifferentiated Coastal Plain deposits in the upland portions of the project and below the surficial loose, wet and organic soils in the low-lying areas consists of very loose to very dense clayey and silty fine to coarse sands (A-3, A-1-b, A-2-4, A-2-6, A-2-7) with clay layers, very soft to hard fine sandy silts (A-4) and very soft to very stiff fine sandy and silty clays (A-7-5, A-7-6). Typically the uplands are located north of the Cape Fear River and portions of the project south of the Cape Fear River. The upland surficial soils typically consist of a very

loose to medium dense silty fine to coarse sand (A-3, A-2-4). Typically, any near surface silts and clays encountered on the project have low to moderate plasticity indices and are below 20 for the entire project.

Roadway embankment soils were found in association with the interchange of US 421 and the Wilmington Bypass. These soils consist of loose to medium dense silty fine to coarse sand (A-2-4).

Artificial fill was encountered at two isolated areas. A stock pile of sandy topsoil is located between approximately stations (415+65 to 416+52 -L-). The stock pile is approximately 8 to 10 feet high. A truck parking area consisting of approximately 1.5 feet of crushed aggregate base course (CABC) stone is located between approximately stations (426+80 to 430+50 -L-).

Groundwater

Groundwater was measured in several of the CPT sounding holes and hand auger borings at the time of drilling. In addition, groundwater levels were calculated from pore pressure measurements acquired from the CPT data. Groundwater depths in the low-lying areas range from the ground surface to about 11 feet below the existing ground surface. Groundwater depths in the upland areas ranged from about 1 to 18 feet below existing grades.

Geotechnical Descriptive Analysis

For descriptive purposes, the project has been divided into two segments. The division of the alignments into two segments is based on the near surface and subsurface materials.

Segment I

-L-	46+25	to	47+70
-L-	49+60	to	50+50
-L-	54+00	to	64+25
-L-	81+50	to	84+75
-L-	94+10	to	96+45
-L-	105+50	to	136+60
-L-	157+25	to	164+50
-L-	187+50	to	190+60
-L-	195+45	to	205+35
-L-	210+30	to	233+15
-L-	235+75	to	237+00
-LP_A1-	15+25	to	17+70
-LP_A1-	17+90	to	18+80
-RP_A1-	10+00	to	14+65
-RP_A1-	19+25	to	19+80
-RP_A1-	21+60	to	23+75
-RP_A1-	25+10	to	26+25
-LP_D1-	13+00	to	22+65
-RP_D1-	10+00	to	17+35
-RP_D1-	25+00	to	31+00
-Y7-	41+50	to	43+50

Segment I consists of portions of the alignments south of the Cape Fear River where roadway embankment fill will be placed over very loose to loose sands and very soft to soft silts and clays with varying organic matter contents, wet to saturated moisture contents and shallow groundwater conditions. Portions of these sections have groundwater/standing water on the surface. Approximately 15 percent of the investigated alignment falls within Segment I.

Groundwater conditions are typically at the ground surface or within three feet of the ground surface.

Soils encountered consist of sands, silts and clays with areas of muck to depths of 1.0 to 6.0 feet beneath the ground surface. The description of soils is described in the Soil Properties section.

Segment II consists of the remaining alignments which consist of fills over Upland Coastal Plain deposits as described in the Soil Properties section of this report. These sections consist of widening existing roadways and new alignments with typical construction methods. Segment II makes up approximately 85 percent of the investigated alignment.

S&ME appreciates the opportunity to be your geotechnical consultant on this project. If you have any questions or need additional information in regard to this report, please contact us.

Very truly yours,
S&ME, Inc.

J. Shane Johnson., P.G.
Project Geologist
N.C. Registration No. 1753

NORTH CAROLINA LICENSED SEAL 1753 2/27/08 GEOLOGIST J. SHANE JOHNSON

Abner F. Riggs, Jr., P.E.
Chief Geotechnical Engineer
N.C. Registration No. 14155

NORTH CAROLINA PROFESSIONAL SEAL 14155 2/27/08 ENGINEER ABNER F. RIGGS, JR.

Attachments

Appendix A

Shelby Tubes

The following Shelby tubes were taken for tests to determine the engineering properties of the soil:

Shelby Tube	Line	Station	Depth (ft)	Test Performed
ST-1	-L-	51+00	23.8-25.8	CU Triaxial Shear Testing and Consolidation Testing
ST-2	-L-	51+00	25.5-27.5	UU Triaxial Shear Testing
ST-3	-L-	101+00	10.3-12.3	CU Triaxial Shear Testing and Consolidation Testing
ST-4	-L-	101+00	17.8-19.8	CU Triaxial Shear Testing and Consolidation Testing
ST-5	-L-	101+00	9.8-11.8	UU Triaxial Shear Testing
ST-6	-L-	101+00	16.5-18.5	UU Triaxial Shear Testing
ST-7	-L-	136+00	13.5-15.5	Consolidation Testing
ST-8	-L-	136+00	13.5-15.5	CU Triaxial Shear Testing
ST-9	-L-	140+00	6.0-8.0	CU Triaxial Shear Testing and Consolidation Testing
ST-10	-L-	140+00	6.0-8.0	UU Triaxial Shear Testing
ST-11	-L-	412+00	31.8-33.8	Consolidation Testing
ST-12	-L-	412+00	32.8-34.8	CU Triaxial Shear Testing
ST-14	-L-	150+00	18.0-20.0	UU Triaxial Shear Testing
ST-15	-L-	150+00	12.0-14.0	CU Triaxial Shear Testing and Consolidation Testing
ST-16	-L-	150+00	18.0-20.0	CU Triaxial Shear Testing and Consolidation Testing

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: R-2633BB COUNTY: Brunswick DATE: 24-Apr-13 COMPILED BY: BKE (LOCHNER) CK BY: DWM SHEET__ OF __ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +25%		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY #1															
-L- 292+00 Beg. Project	317+40.00 Beg. Bridge	577				577	358,154		358,154	447,693	447,116				
-RPA3- 18+00	31+35.18	450				450	17,212		17,212	21,515	21,065				
-RPD3- 17+50	26+40.30	178				178	10,690		10,690	13,363	13,185				
SUMMARY #1	SUBTOTAL	1,205				1,205	386,056		386,056	482,570	481,365				
SUMMARY #2															
-L- 389+25.00 End Bridge	397+79.55 Beg. Bridge						168,272		168,272	210,340	210,340				
SUMMARY #2	SUBTOTAL						168,272		168,272	210,340	210,340				
SUMMARY #3															
-L- 399+77.00 End Bridge	423+98.44 BEG. BRIDGE	49				49	498,399		498,399	622,999	622,950				
SUMMARY #3	SUBTOTAL	49				49	498,399		498,399	622,999	622,950				
SUMMARY #4															
-L- 426+22.41 End Bridge	440+06.92 Beg. Bridge						467,700		467,700	584,625	584,625				
RP_B4 18+00	20+87.34						50,290		50,290	62,863	62,863				
SUMMARY #4	SUBTOTAL						517,990		517,990	647,488	647,488				
SUMMARY #5															
-L- 441+01.39 End Bridge	447+24.07 End Project	772				772	109,982		109,982	137,478	136,706				
RP_B4 22+17.34 End Bridge	33+41.66	841				841	59,156		59,156	73,945	73,104				
RP_C4 24+00	26+50	181				181	2,284		2,284	2,855	2,674				
-Y1- 37+50	41+00	238				238	387		387	484	246				
-EY12DR1- 10+00	13+00	196				196							196		196
-BASIN- 433+00	440+00	54,555				54,555							54,555		54,555
SUMMARY #5	SUBTOTAL	56,783				56,783	171,809		171,809	214,761	212,729		54,751		54,751
PROJECT SUBTOTAL		58,037				58,037	1,742,526		1,742,526	2,178,158	2,174,872		54,751		54,751
LOSS DUE TO CLEARING & GRUBBING											-54,751		-54,751		-54,751
WASTE IN LIEU OF BORROW															
SHOULDER MATERIAL							10,000		10,000	12,500	12,500				
PROJECT TOTAL		58,037				58,037	1,752,526		1,752,526	2,190,658	2,132,621				
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											106,631				
GRAND TOTAL		58,037				58,037	1,752,526		1,752,526	2,190,658	2,239,252				
SAY		**59,000**									**2,240,000**				

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

EST. UNDERCUT =4,500 CY EST. DDE = 4,700 CY

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 50+09.64
Δ = 40° 43' 04.0" (RT)
D = 0° 34' 54.1"
L = 7,000.00'
T = 3,655.14'
R = 9,850.00'

NAD 83

10 15 20

POT Sta. 8+00.00

PCS Sta. 13+54.50

-BL- 52 PINC 238+88.54

-BL- 53 PINC 243+95.78

BM52 ELEVATION 74.09'
-BL- STA 235+91.13' LT
RR SPIKE IN BASE OF 12" PINE

N 17° 02' 06.7" W

N 16° 59' 00.0" W

N 14° 32' 10.7" W

-L- (FUTURE)

N 14° 00' 05.6" W

N 21° 30' 01" E
590.83'

GENERAL WOOD PRESERVING COMPANY, INC.
DB 572 PG 949
MB 9 PG 11

R/W WILL BE ACQUIRED UNDER TIP PROJECT R-2633B
CONSTRUCTION WILL BE COMPLETED UNDER TIP PROJECT R-2633A

MATCH TO SHEET 5 -L- STA. 21+00.00

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE NAD 83/95 STATE PLANE COORDINATES FOR THE NGS MONUMENT "PHOENIX 2"
WITH STATE PLANE GRID COORDINATES OF
NORTHING: 196121.9921(1) EASTING: 2278129.037(11)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00002789978
THE NC LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PHOENIX 2" TO -L- STATION 8+00.00 IS
S 2° 05' 43.45" E 12,845.18'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 88

SEE SHEET 42 FOR FUTURE PROFILE

-L-
PI Sta 50+09.64
Δ = 40° 43′ 04.0″ (RT)
D = 0° 34′ 54.1″
L = 7,000.00′
T = 3,655.14′
R = 9,850.00′
e = 2.5%

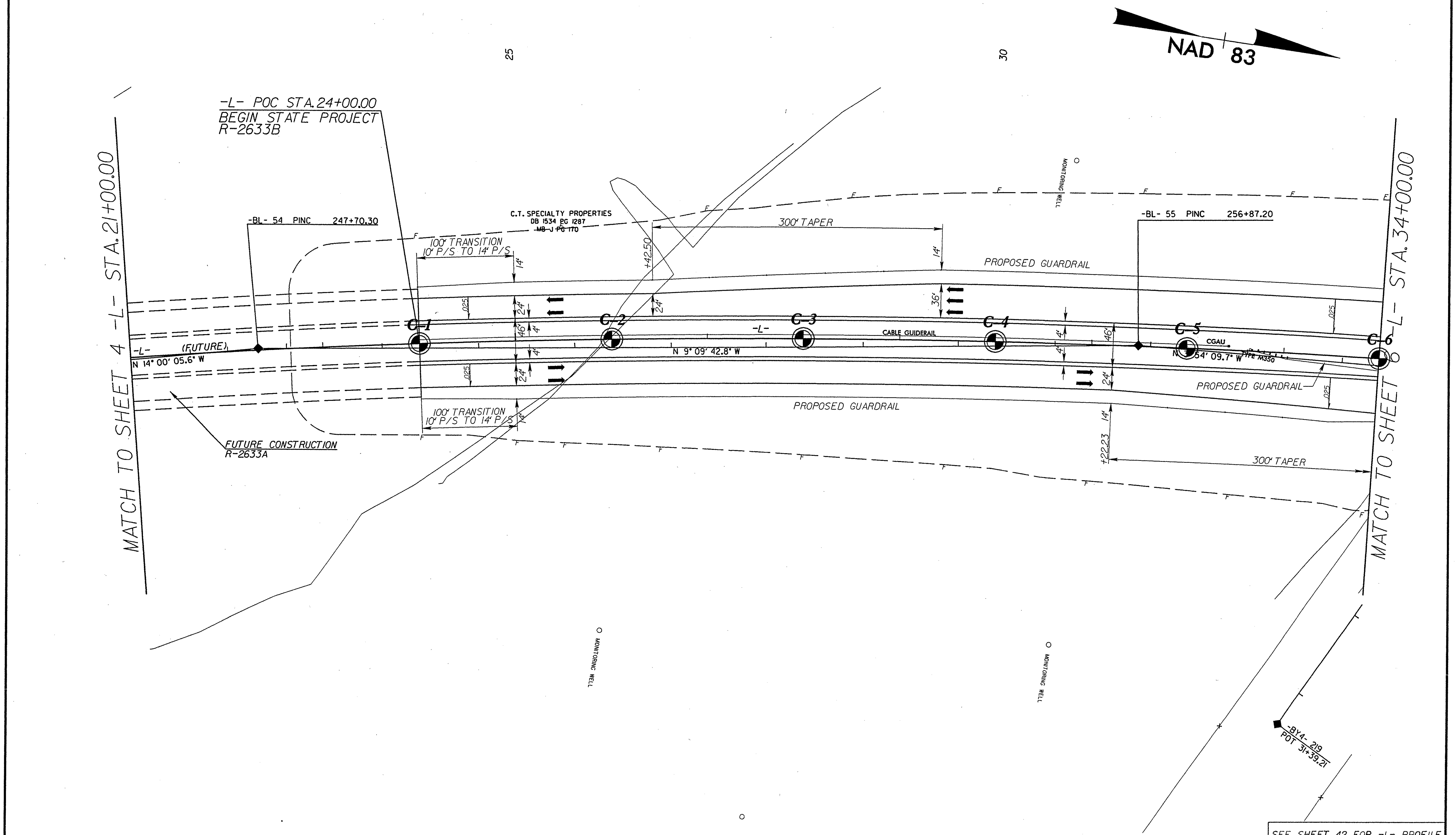
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

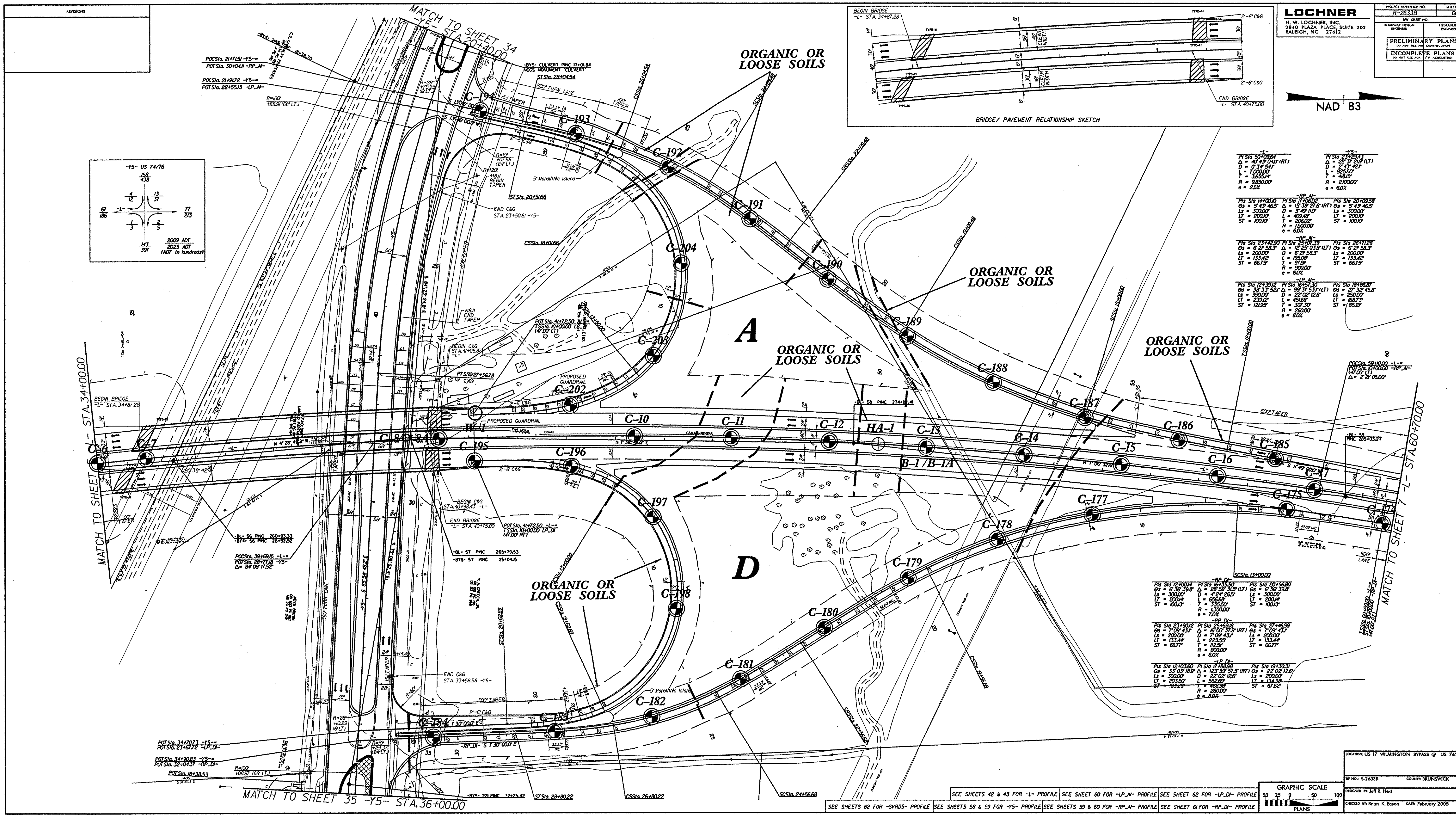
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
25
30
-L- POC STA. 24+00.00
BEGIN STATE PROJECT
R-2633B
MATCH TO SHEET 4 -L- STA. 21+00.00
MATCH TO SHEET 6 -L- STA. 34+00.00
-BL- 54 PINC 247+70.30
-BL- 55 PINC 256+87.20
C.T. SPECIALTY PROPERTIES
DB 1534 PG 1287
MB-J PG 170
100′ TRANSITION
10′ P/S TO 14′ P/S
300′ TAPER
PROPOSED GUARDRAIL
CABLE GUIDERAIL
-L- (FUTURE)
N 14° 00′ 05.6″ W
N 9° 09′ 42.8″ W
CGAU
FUTURE CONSTRUCTION
R-2633A
C-1
C-2
C-3
C-4
C-5
C-6
MONITORING WELL
-BYA- 219
POT 31+39.21

SEE SHEET 42 FOR -L- PROFILE



LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
R-2633B
06
PRELIMINARY PLANS
INCOMPLETE PLANS
NAD 83
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH
BEGIN BRIDGE -L- STA. 34+87.28
END BRIDGE -L- STA. 40+75.00
MATCH TO SHEET 34 -Y5- STA.20+40.00
MATCH TO SHEET 6 -L- STA.34+00.00
MATCH TO SHEET 7 -L- STA.60+70.00
MATCH TO SHEET 35 -Y5- STA.36+00.00
ORGANIC OR LOOSE SOILS
ORGANIC OR LOOSE SOILS
ORGANIC OR LOOSE SOILS
ORGANIC OR LOOSE SOILS
ORGANIC OR LOOSE SOILS
A
D
HA-1
B-1/B-1A
W-1
PROPOSED GUARDRAIL
5' Monolithic Island
2009 ADT
2025 ADT
(ADT in hundreds)
-Y5- US 74/76
SEE SHEETS 42 & 43 FOR -L- PROFILE
SEE SHEET 60 FOR -LP_A- PROFILE
SEE SHEET 62 FOR -LP_DI- PROFILE
SEE SHEETS 62 FOR -SVR05- PROFILE
SEE SHEETS 58 & 59 FOR -Y5- PROFILE
SEE SHEETS 59 & 60 FOR -RP_A- PROFILE
SEE SHEET 61 FOR -RP_DI- PROFILE
GRAPHIC SCALE
PLANS
LOCATION: US 17 WILMINGTON BYPASS @ US 74/76
COUNTY: BRUNSWICK
DATE: February 2005

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 50+09.64
Δ = 40° 43' 04.0" (RT)
D = 0° 34' 54.1"
L = 7,000.00'
T = 3,655.14'
R = 9,850.00'
e = 2.5%

NAD 83

MATCH TO SHEET 6 -L- STA. 60+70.00

MATCH TO SHEET 8 -L- STA. 74+30.00

ORGANIC OR LOOSE SOILS

600' TAPER

-L- 21+35

-BL- 60 PINC 292+87.25

C-18 C-19 C-20 C-21 C-22 C-23 C-24

CABLE GUIDERAIL

N 11° 40' 41.5" E

N 17° 07' 29.2" E

65 70

MLH, LLC.
DB 1875 PG 1261
DB 1878 PG 500
MB R PG 047

WCM ENTERPRISES, LLC.
DB 1223 PG 223
MB R PG 047
DB 933 PG 176
MB U PG 164

600' ACCELERATION LANE

300' TAPER

+50.00

+50.00

POT Sta. 10+00.00

MATCH TO INSET AA THIS SHEET

MATCH TO INSET AA THIS SHEET

-SVRD6- S 85° 36' 41.6" E

R=30'

R=30'

POT Sta. 15+90.55

NEED ADDITIONAL SURVEYS TO COMPLETE DESIGN

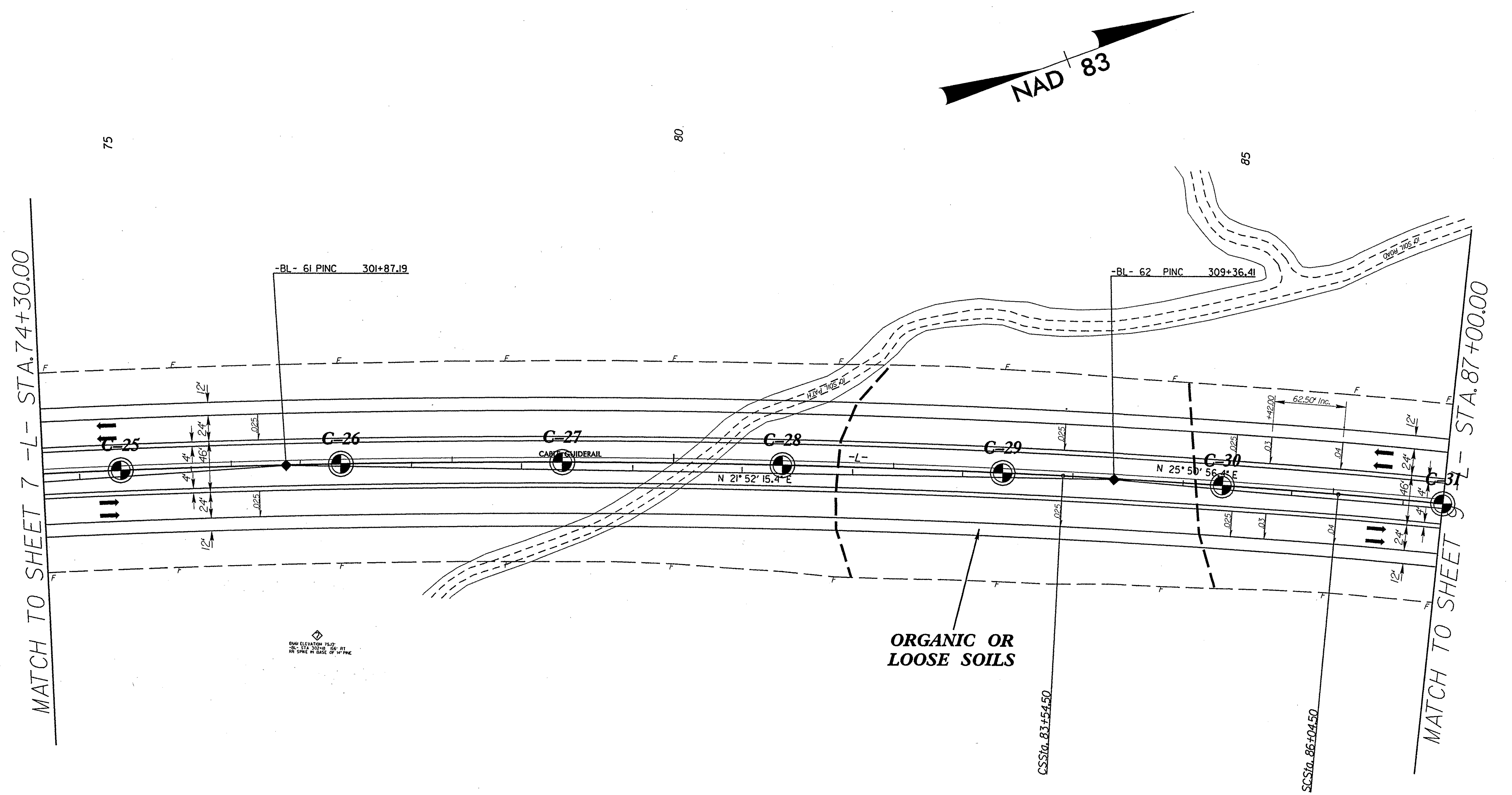
SEE SHEET 43 FOR -L- PROFILE

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612	R-2633B	08
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

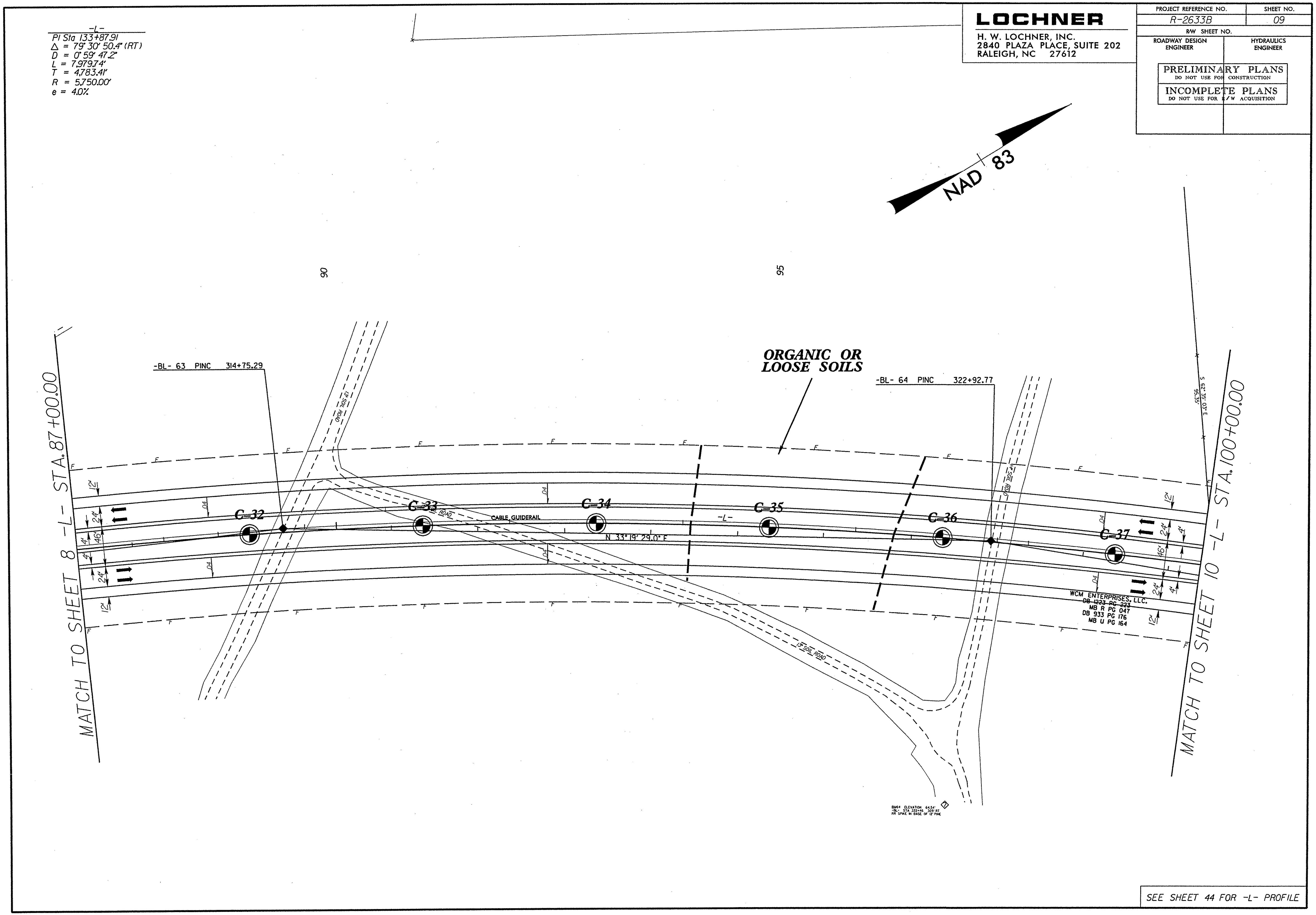
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-	-L-	
PI Sta 50+09.64	PIs Sta 84+90.46	PI Sta 133+87.91
Δ = 40° 43′ 04.0″ (RT)	θs = 0° 43′ 37.5″	Δ = 79° 30′ 50.4″ (RT)
D = 0° 34′ 54.1″	θs = 1° 14′ 44.1″	D = 0° 59′ 47.2″
L = 7,000.00′	Ls = 250.00′	L = 7,979.74′
T = 3,655.14′	LT = 135.96′	T = 4,783.41′
R = 9,850.00′	ST = 114.06′	R = 5,750.00′
e = 2.5%		e = 4.0%



SEE SHEET 44 FOR -L- PROFILE


-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
09
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
NAD 83
ORGANIC OR LOOSE SOILS
-BL- 63 PINC 314+75.29
-BL- 64 PINC 322+92.77
C-32
C-33
C-34
C-35
C-36
C-37
CABLE GUIDERAIL
N 33° 19' 29.0" E
-L-
WCM ENTERPRISES, LLC.
DB 1223 PG 223
MB R PG 047
DB 933 PG 176
MB U PG 164
MATCH TO SHEET 8 -L- STA.87+00.00
MATCH TO SHEET 10 -L- STA.100+00.00
SEE SHEET 44 FOR -L- PROFILE

-L-
PI Sta 133+87.91
△ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

105

110

MATCH TO SHEET 9 -L- STA. 100+00.00

MATCH TO SHEET 11 -L- STA. 112+00.00

12' X 6' RCBC
WILDLIFE CROSSING

-BL- 65 PINC 331+87.53

ORGANIC OR LOOSE SOILS

PROPOSED GUARDRAIL

CABLE GUIDERAIL

C-38 C-39 C-40 C-41 C-42 C-43 C-44

B-2 / B-2A

-L-

N 41° 40' 15.8" E

N 49° 34' 10.4" E

8:1 CAT-1

8:1 GRAU 350

MLH, LLC.
DB 1908 PG 874
DB 1878 PG 497
DB 1878 PG 500
MB R PG 047

S 62° 35' 07" E
161.49'

N 17° 28' 31" E
1,258.33'

SEE SHEET 45 FOR -L- PROFILE

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 133+87.91
△ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%

NAD 83

115

120

ORGANIC OR LOOSE SOILS

MATCH TO SHEET 10 -L- STA. 112+00.00

MATCH TO SHEET 12 -L- STA. 125+00.00

PROPOSED GUARDRAIL

GRAU 350

8:1

C-44 C-45 C-46 C-47 C-48 C-49 C-50

CABLE GUIDERAIL

-L-

N 56° 32' 56.2" E

N 63° 36' 37.0" E

-BL- 66 PINC 338+87.92

-BL- 67 PINC 345+87.54

CHADWICK-ONE, LLC.
DB 1009 PG 192
MB R PG 047

SEE SHEET 45 FOR -L- PROFILE

LOCHNER

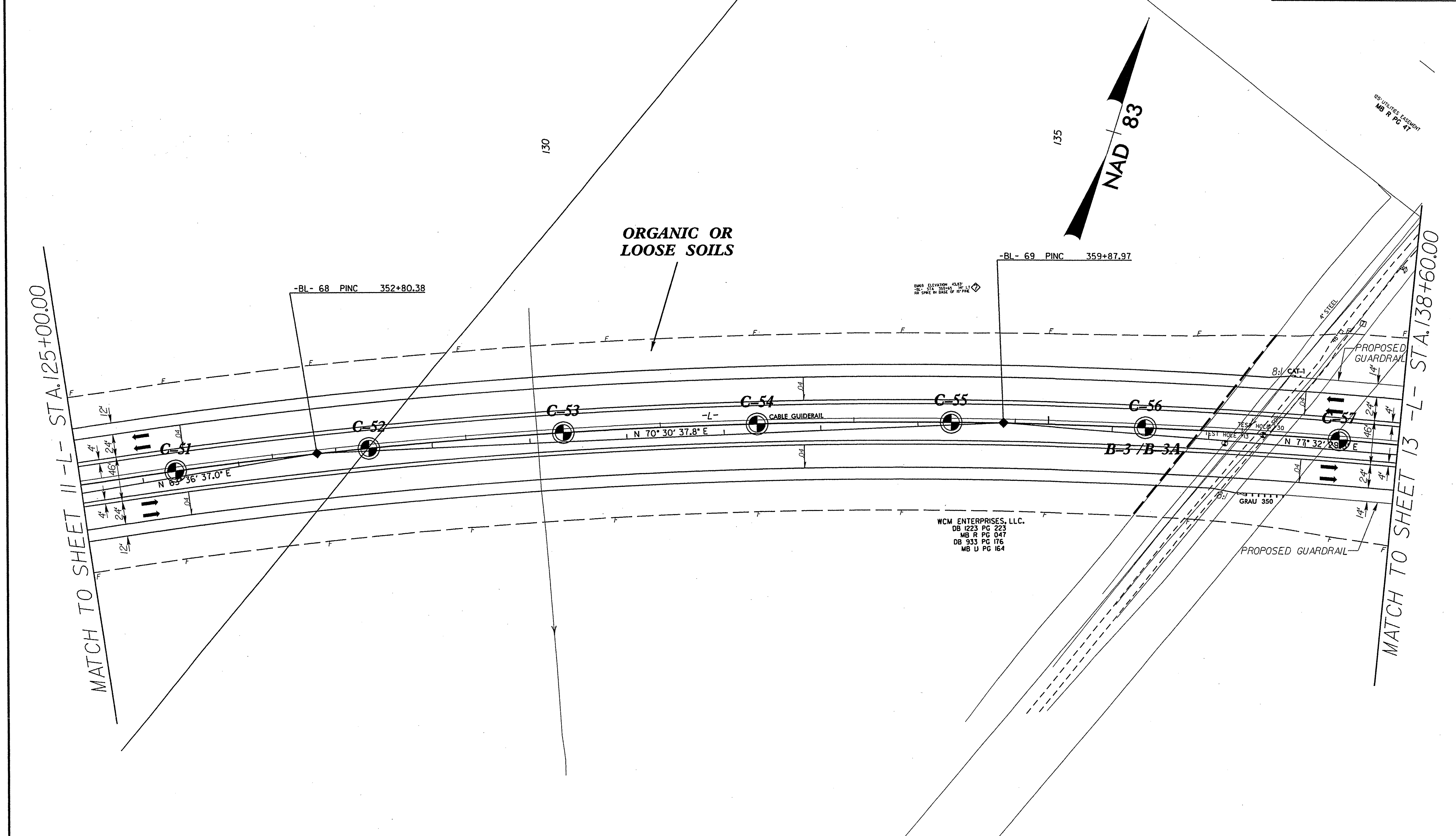
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

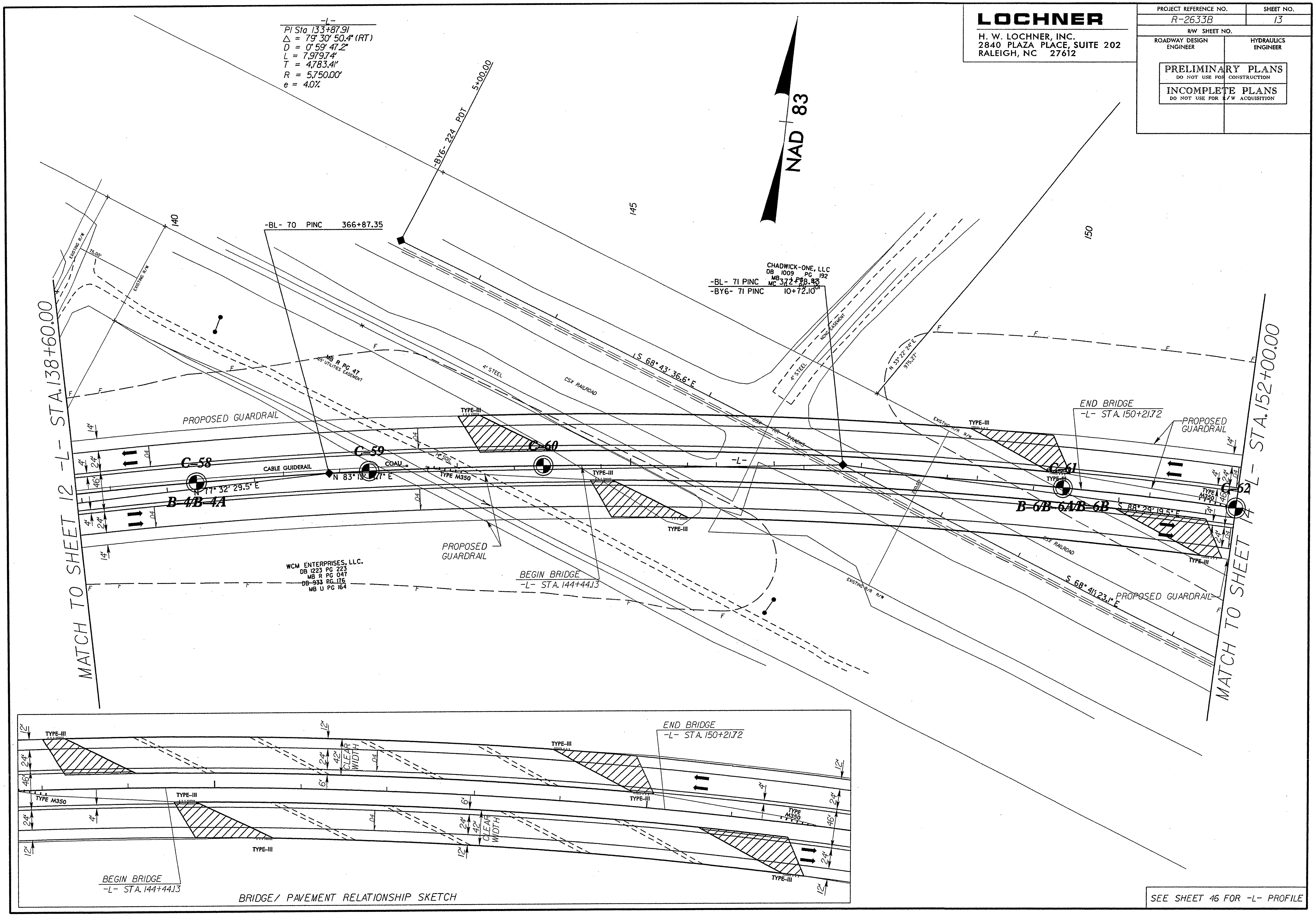
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 133+87.91
Δ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%



SEE SHEET 46 FOR -L- PROFILE


LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO.
R-2633B
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
PI Sta 133+87.91
△ = 79° 30' 50.4" (RT)
D = 0° 59' 47.2"
L = 7,979.74'
T = 4,783.41'
R = 5,750.00'
e = 4.0%
NAD 83
-BY6- 224 POT 5+00.00
-BL- 70 PINC 366+87.35
-BL- 71 PINC
-BY6- 71 PINC 10+72.10
CHADWICK-ONE, LLC
DB 1009 PG 192
MB 3 PG 101
S 68° 43' 36.6" E
CSX RAILROAD
4" STEEL
PROPOSED GUARDRAIL
CABLE GUIDERAIL
TYPE M350
TYPE-III
C-58
C-59
C-60
C-61
C-62
B-4/B-4A
B-6/B-6A/B-6B
N 77° 32' 29.5" E
N 83° 13' 47" E
S 88° 29' 19.5" E
S 68° 41' 23.1" E
END BRIDGE
-L- STA. 150+21.72
BEGIN BRIDGE
-L- STA. 144+44.13
PROPOSED GUARDRAIL
WCM ENTERPRISES, LLC.
DB 1223 PG 223
MB R PG 047
DB 933 PG 176
MB U PG 164
MB R PG 47
25' UTILITIES EASEMENT
EXISTING R/W
140
145
150
MATCH TO SHEET 12 -L- STA.138+60.00
MATCH TO SHEET 14 -L- STA.152+00.00
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH
CLEAR WIDTH
SEE SHEET 46 FOR -L- PROFILE

-L-	-RP_B2-	
PI Sta 133+87.91	PI Sta 1+62.31	PIs Sta 4+07.87
△ = 79° 30′ 50.4″ (RT)	△ = 3° 12′ 27.2″ (RT)	Θs = 1° 14′ 07.7″
D = 0° 59′ 47.2″	D = 0° 59′ 18.1″	Ls = 250.00′
L = 7,979.74′	L = 324.53′	LT = 166.67′
T = 4,783.41′	T = 162.31′	ST = 83.34′
R = 5,750.00′	R = 5,797.00′	
e = 4.0%	e = 4.0%	

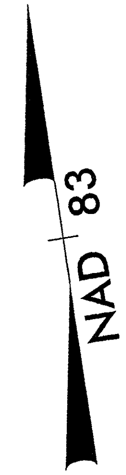
LOCHNER

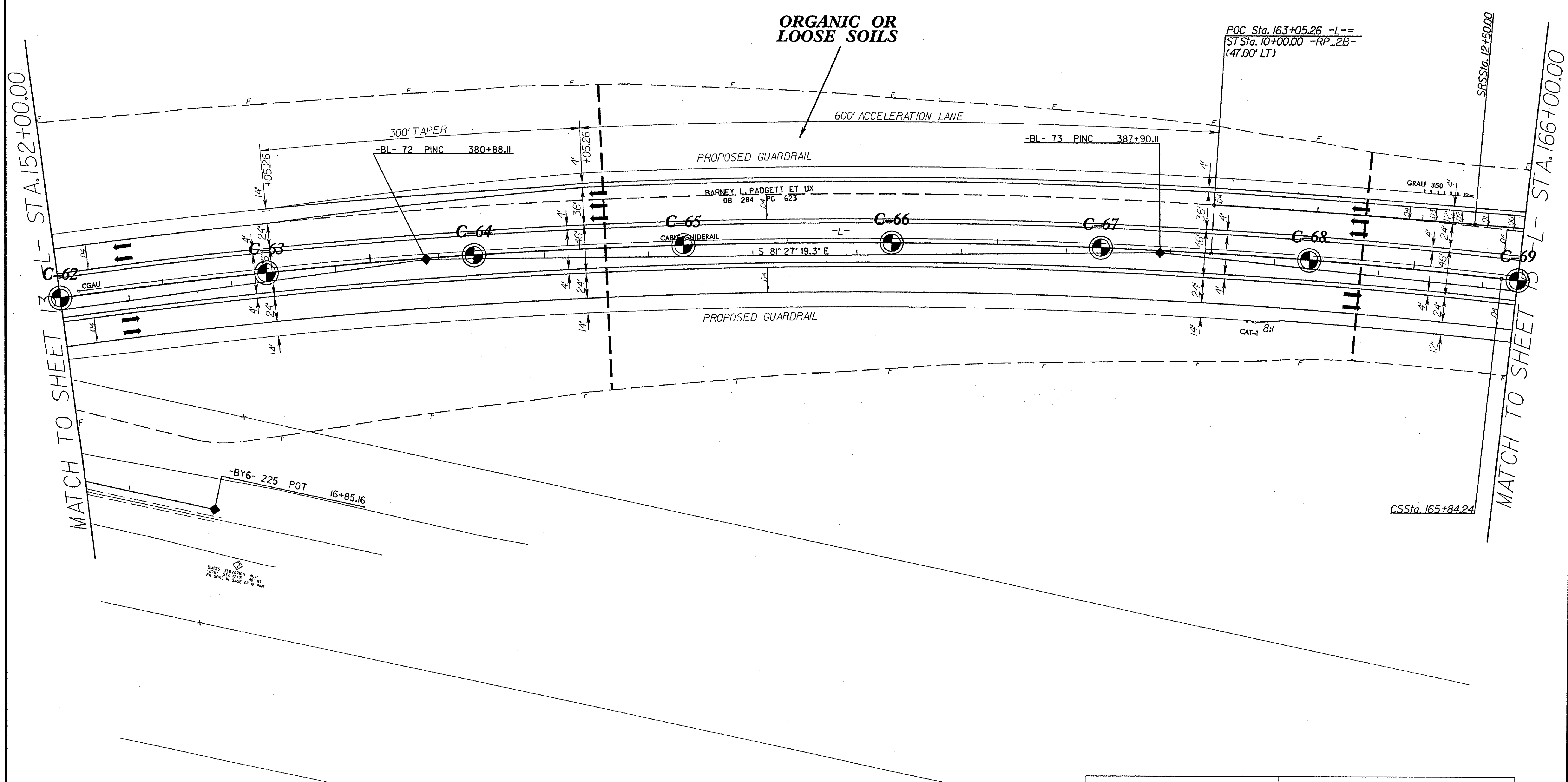
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

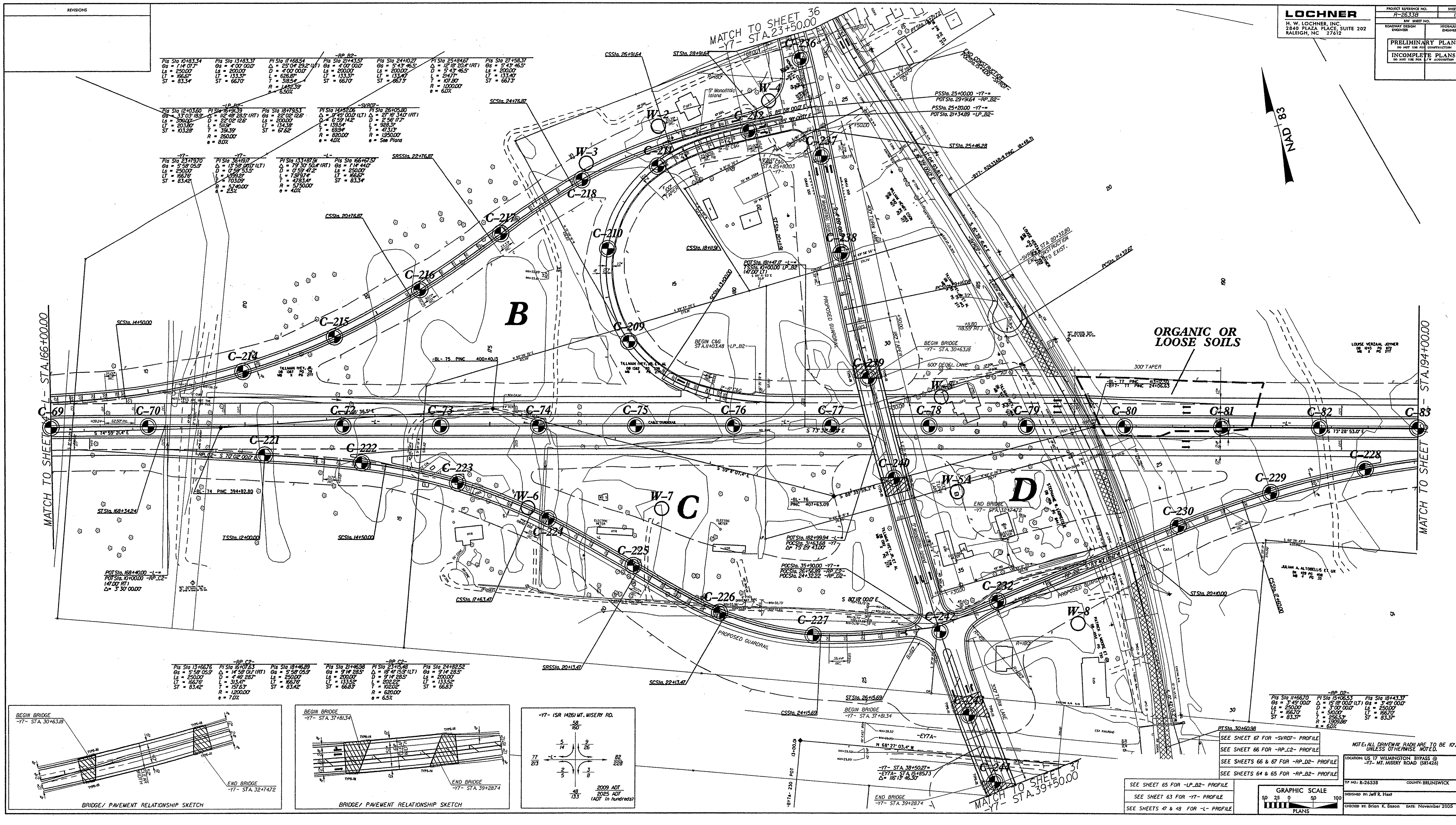
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION




155
160
ORGANIC OR LOOSE SOILS
POC Sta. 163+05.26 -L-=
ST Sta. 10+00.00 -RP_2B-
(47.00′ LT)
SRSSta. 12+50.00
MATCH TO SHEET 13 -L- STA. 152+00.00
MATCH TO SHEET 15 -L- STA. 166+00.00
300′ TAPER
600′ ACCELERATION LANE
-BL- 72 PINC 380+88.11
-BL- 73 PINC 387+90.11
PROPOSED GUARDRAIL
BARNEY L. PADGETT ET UX
DB 284 PG 623
C-62
C-63
C-64
C-65
C-66
C-67
C-68
C-69
S 81° 27′ 19.3″ E
-L-
CGAU
GRAU 350
CAT-1
8:1
-BY6- 225 POT 16+85.16
CSSta. 165+84.24

SEE SHEET 47 FOR -L- PROFILE | SEE SHEET 64 FOR -RAMP_B2- PROFILE



REVISIONS
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO. R-2633B
SHEET NO. 15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
NAD 83
MATCH TO SHEET 36 -Y7- STA.23+50.00
MATCH TO SHEET -L- STA.166+00.00
MATCH TO SHEET -L- STA.194+00.00
MATCH TO SHEET 37 -Y7- STA.39+50.00
B
C
D
ORGANIC OR
LOOSE SOILS
C-69
C-70
C-72
C-73
C-74
C-75
C-76
C-77
C-78
C-79
C-80
C-81
C-82
C-83
C-209
C-210
C-211
C-212
C-214
C-215
C-216
C-217
C-218
C-221
C-222
C-223
C-224
C-225
C-226
C-227
C-228
C-229
C-230
C-232
C-236
C-237
C-238
C-239
C-240
C-242
C-243
C-244
W-2
W-3
W-4
W-5A
W-6
W-7
W-8
PROPOSED GUARDRAIL
CSX RAILROAD
-RP_D2-
Pls Sta 11+66.70
Θs = 3°45' 00.0"
Ls = 250.00'
LT = 166.70'
ST = 83.37'
PI Sta 15+06.53
Δ = 15°18' 00.0" (LT)
D = 3°00' 00.0"
L = 510.00'
T = 256.53'
R = 1,909.86'
e = 6.0%
Pls Sta 18+43.37
Θs = 3°45' 00.0"
Ls = 250.00'
LT = 166.70'
ST = 83.37'
PT Sta. 30+60.98
SEE SHEET 67 FOR -SVRD7- PROFILE
SEE SHEET 66 FOR -RP_C2- PROFILE
SEE SHEETS 66 & 67 FOR -RP_D2- PROFILE
SEE SHEETS 64 & 65 FOR -RP_B2- PROFILE
SEE SHEET 65 FOR -LP_B2- PROFILE
SEE SHEET 63 FOR -Y7- PROFILE
SEE SHEETS 47 & 48 FOR -L- PROFILE
NOTE: ALL DRIVEWAY RADII ARE TO BE 10'.
UNLESS OTHERWISE NOTED.
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION: US 17 WILMINGTON BYPASS @
-Y7- MT. MISERY ROAD (SR1426)
TIP NO.: R-2633B
COUNTY: BRUNSWICK
DESIGNED BY: Jeff R. Hext
CHECKED BY: Brian K. Eason
DATE: November 2005
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH
BEGIN BRIDGE -Y7- STA. 30+63.18
END BRIDGE -Y7- STA. 32+74.72
BEGIN BRIDGE -Y7- STA. 37+81.34
END BRIDGE -Y7- STA. 39+28.74
-Y7- (SR 1426) MT. MISERY RD.
2009 ADT
2025 ADT
(ADT in hundreds)

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

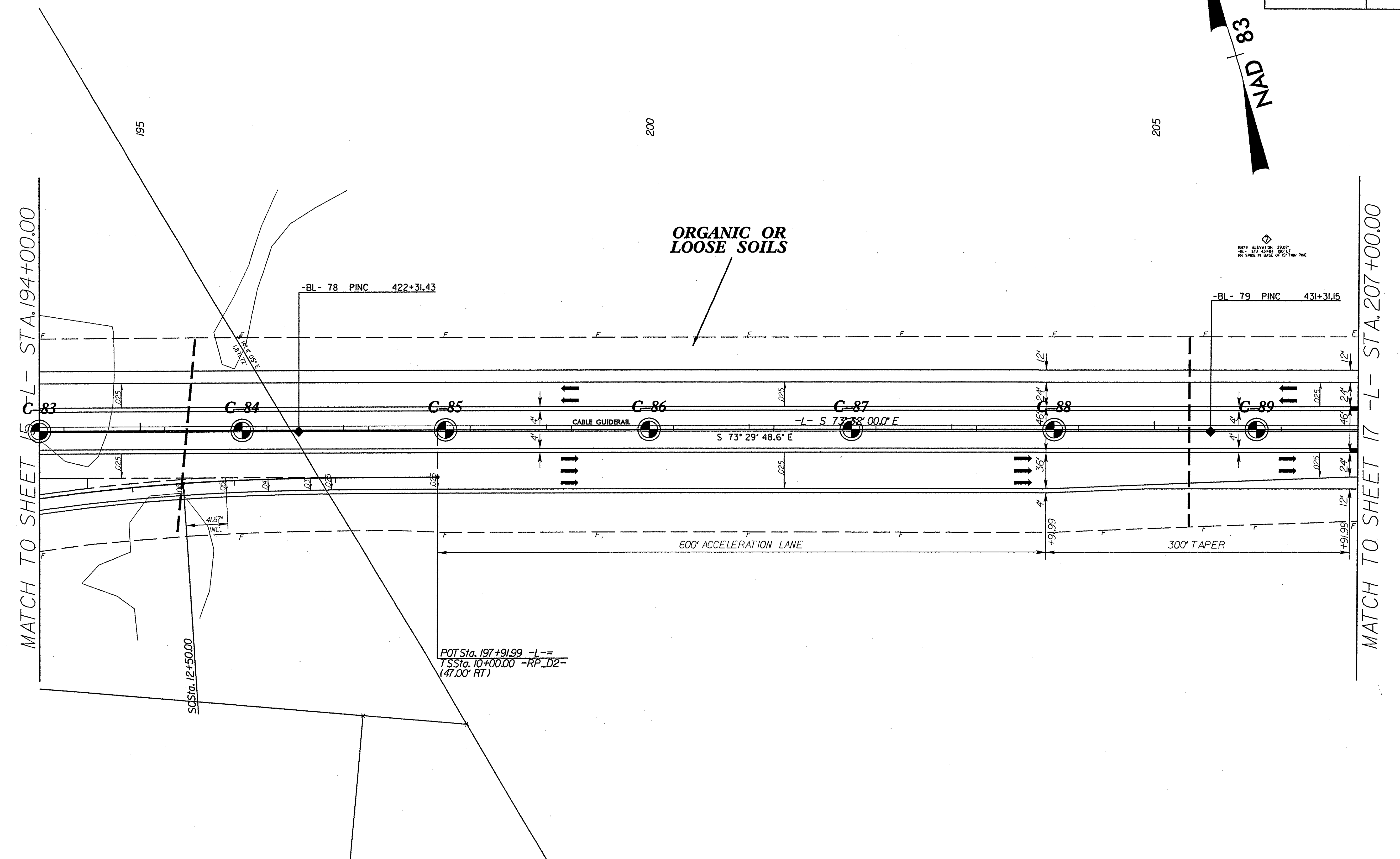
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RP_D2-

PIs Sta 11+66.70	PI Sta 15+06.53	PIs Sta 18+43.37
Θs = 3° 45' 00.0"	Δ = 15° 18' 00.0" (LT)	Θs = 3° 45' 00.0"
Ls = 250.00'	D = 3° 00' 00.0"	Ls = 250.00'
LT = 166.70'	L = 510.00'	LT = 166.70'
ST = 83.37'	T = 256.53'	ST = 83.37'
	R = 1,909.86'	
	e = 6.0%	



SEE SHEET 48 FOR -L- PROFILE

SEE SHEET 66 FOR -RAMP_D2- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

210 215 220

-L- STA. 207+00.00

MATCH TO SHEET 16 -L-

ORGANIC OR LOOSE SOILS

-BL- 80 PINC 441+29.52

C-90 C-91 C-92 C-93 C-94 C-95 C-96

CABLE GUIDERAIL

-L- S 73° 32' 00.0" E

S 73° 32' 47.2" E

S 73° 33' 42.7" E

S 41° 56' 21" W
436.02'

LINCOLN DEVELOPMENT CO., INC.
DB 254 PG 20
MB 4 PG 156

12' 24' 4' 46' 4' 24' 12'

.025

-L- STA. 221+00.00

MATCH TO SHEET 18 -L-

SEE SHEET 49 FOR -L- PROFILE

-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%

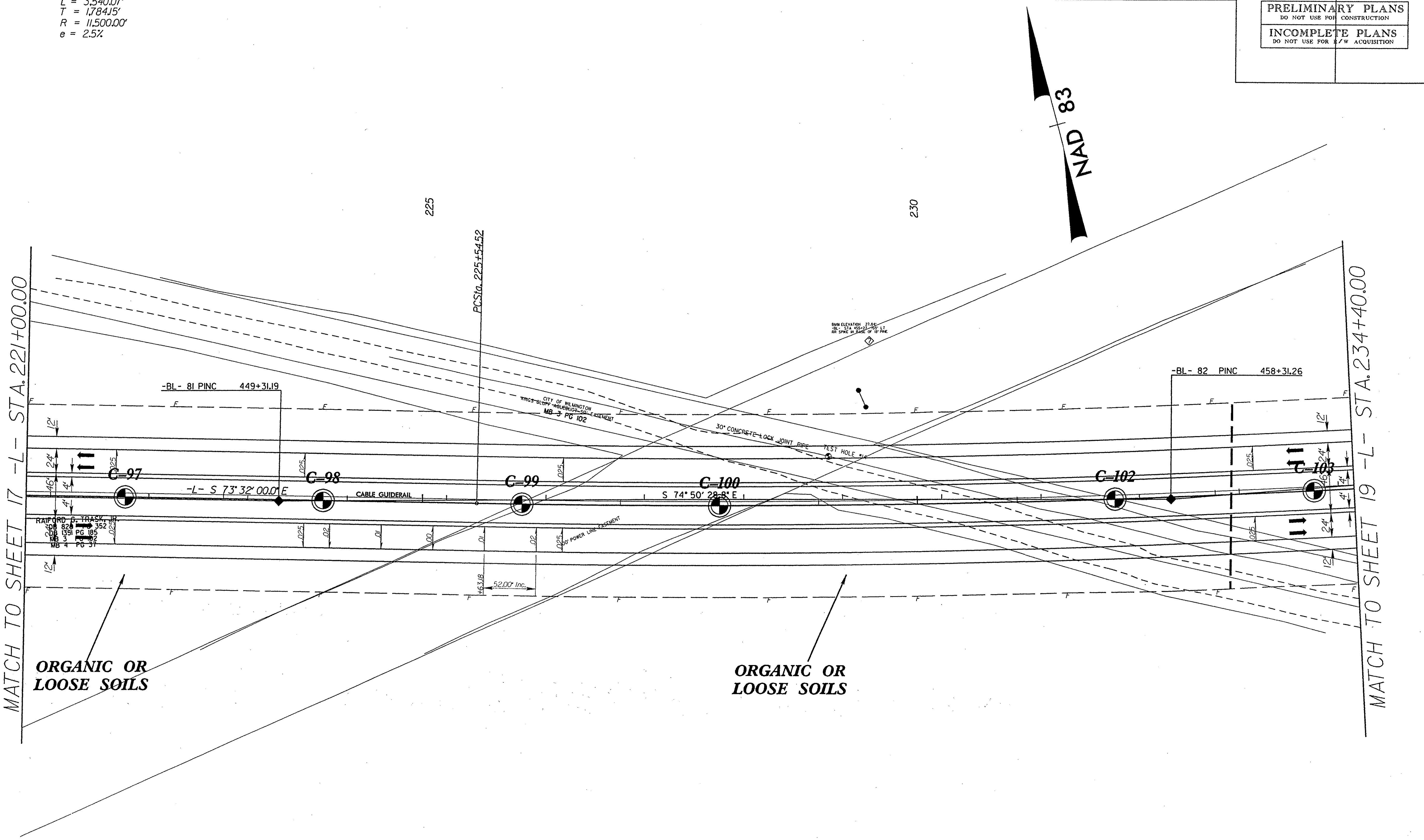
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



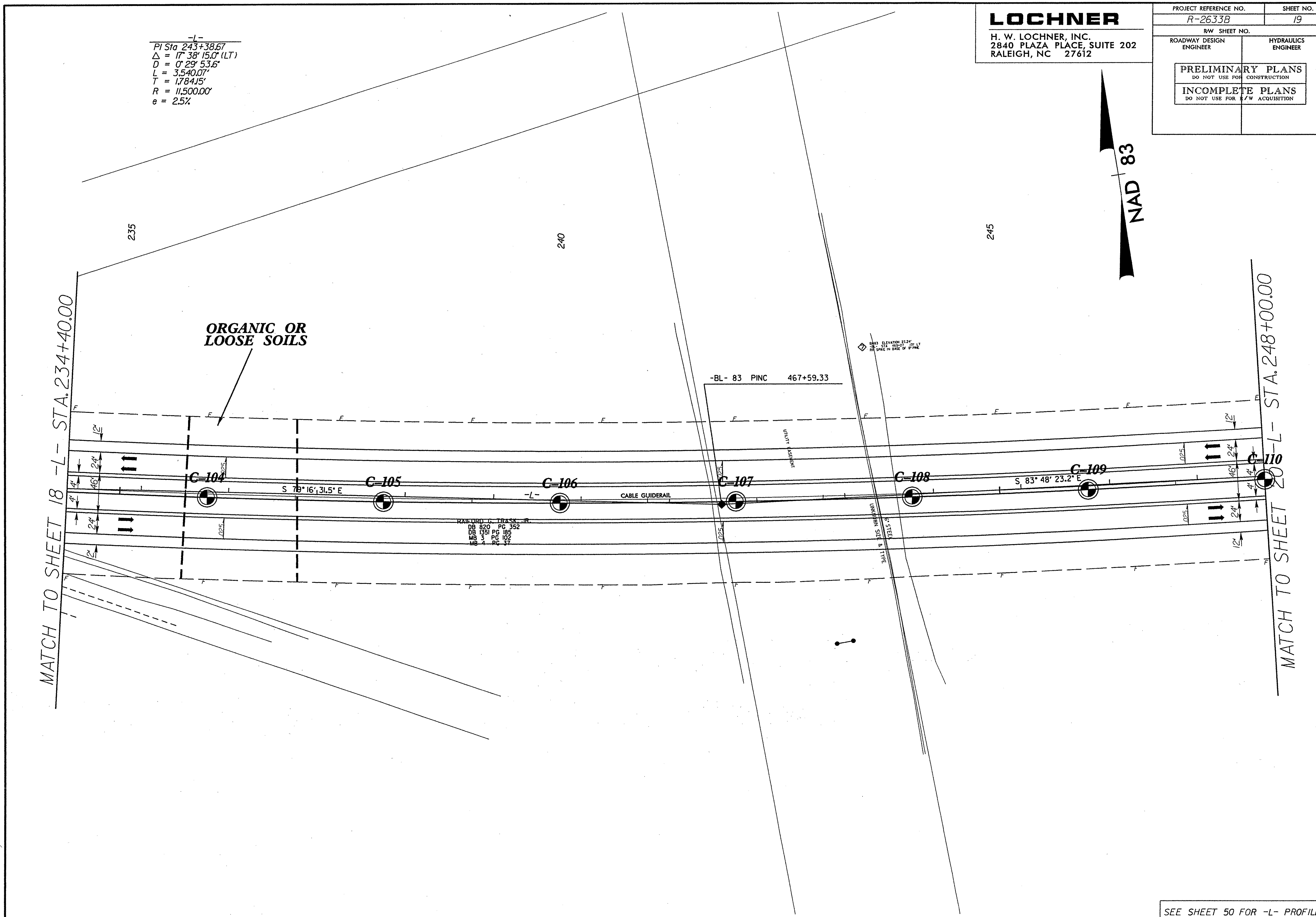
SEE SHEET 49 FOR -L- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SEE SHEET 50 FOR -L- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

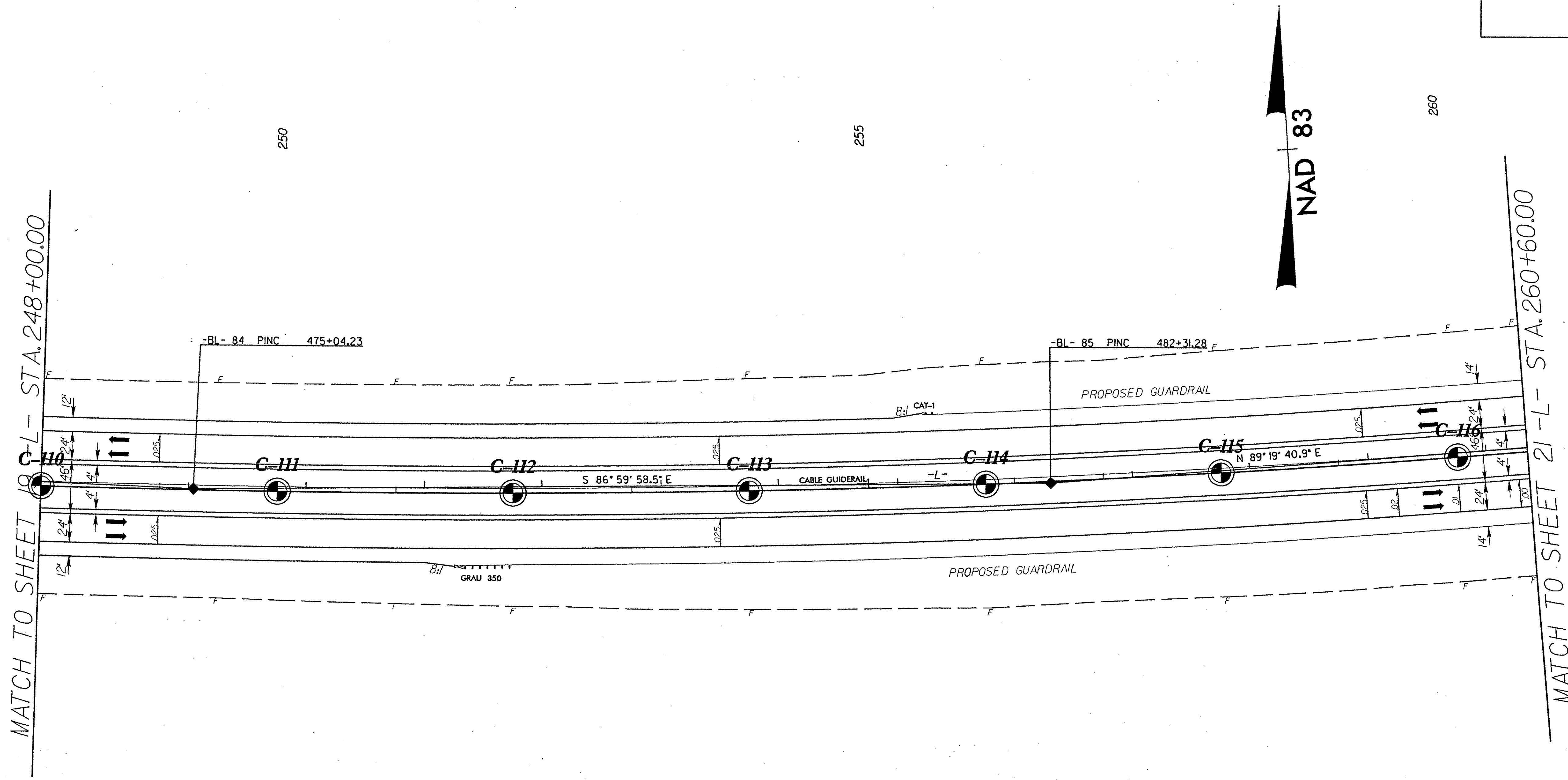
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%



SEE SHEET 50 FOR -L- PROFILE

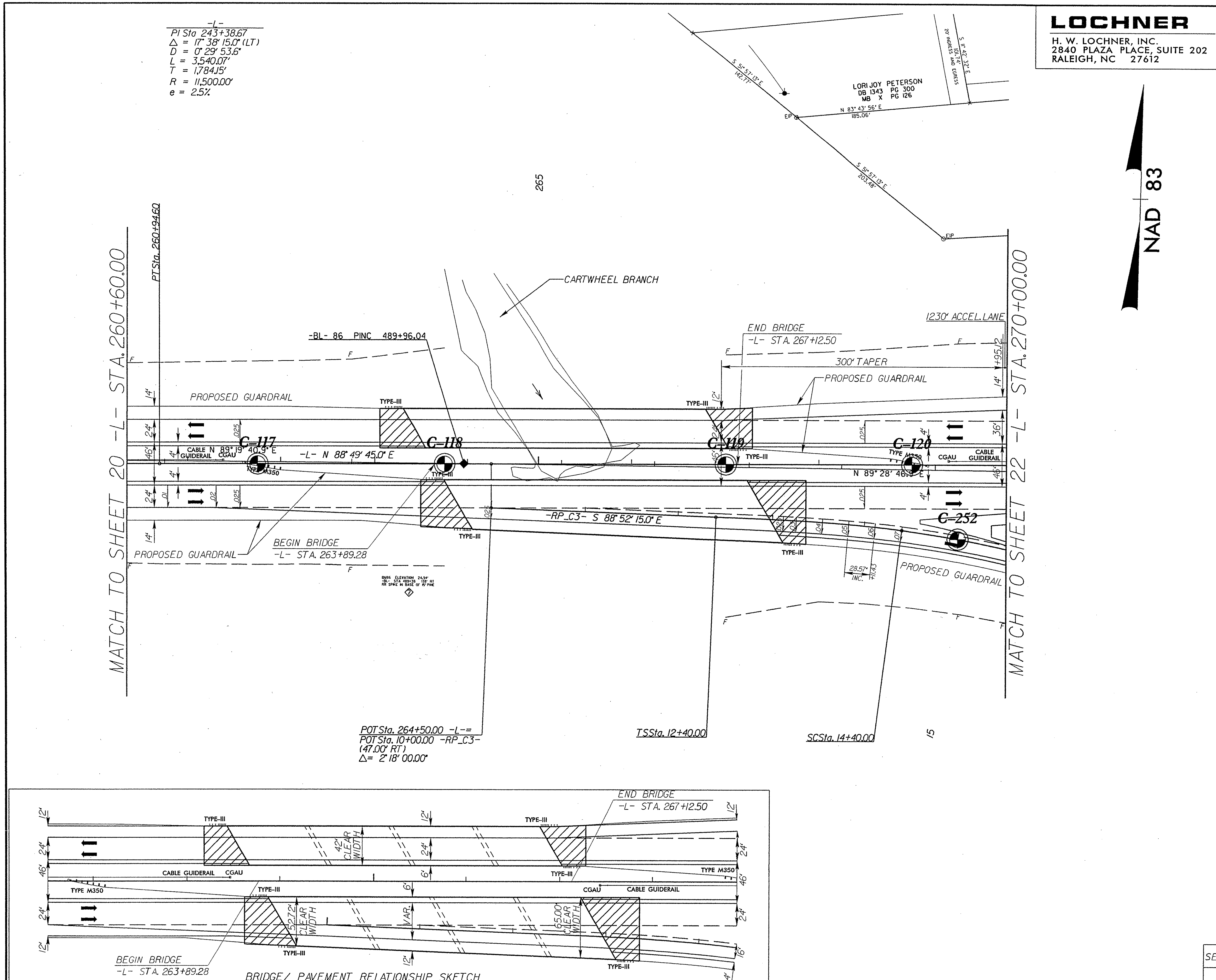
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	21

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

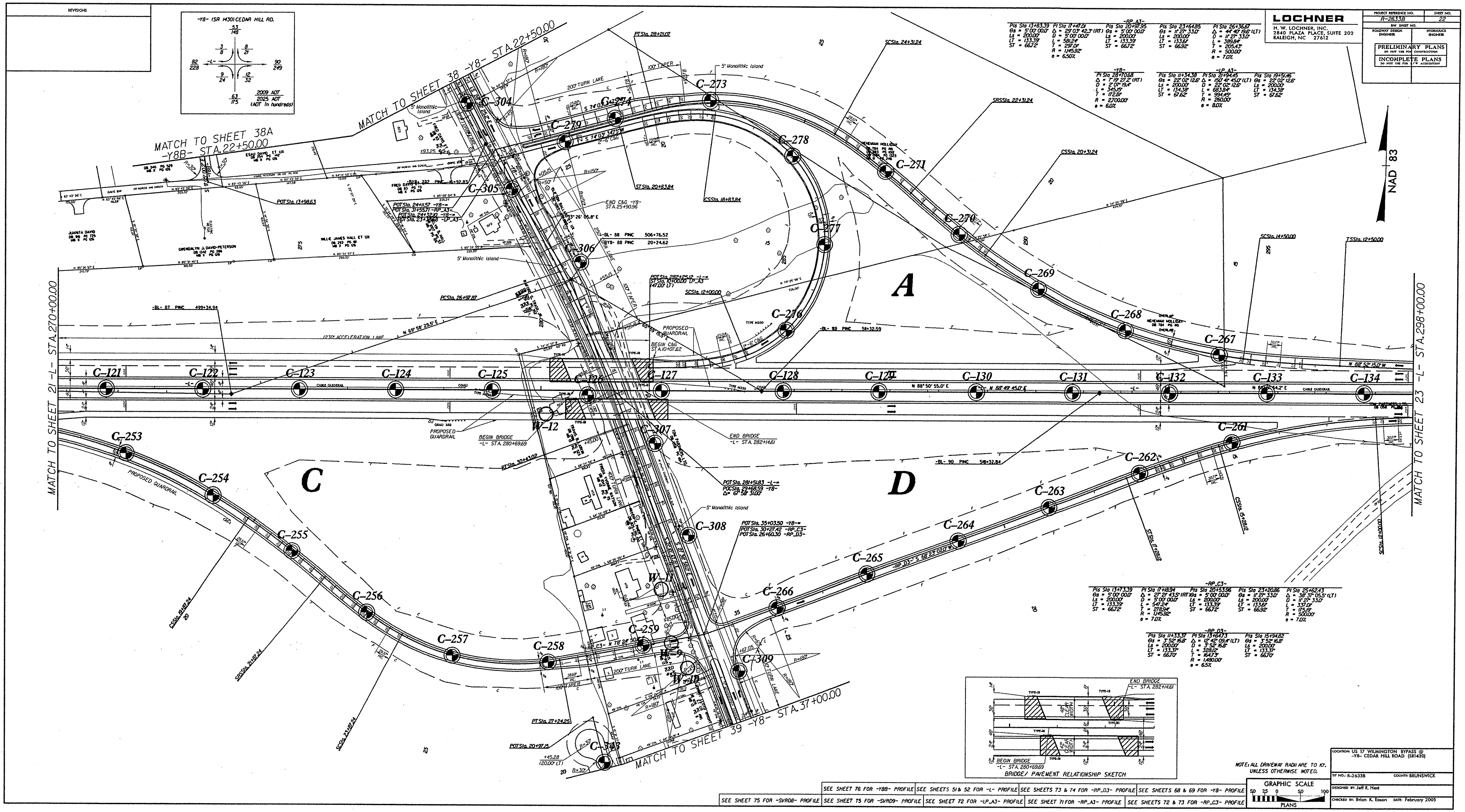
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION


-L-
PI Sta 243+38.67
Δ = 17° 38' 15.0" (LT)
D = 0° 29' 53.6"
L = 3,540.07'
T = 1,784.15'
R = 11,500.00'
e = 2.5%
LORI JOY PETERSON
DB 1343 PG 300
MB X PG 126
NAD 83
CARTWHEEL BRANCH
MATCH TO SHEET 20 -L- STA. 260+60.00
MATCH TO SHEET 22 -L- STA. 270+00.00
PI Sta. 260+94.60
-BL- 86 PINC 489+96.04
END BRIDGE
-L- STA. 267+12.50
1230' ACCEL. LANE
300' TAPER
PROPOSED GUARDRAIL
C-117
C-118
C-119
C-120
C-252
-L- N 88° 49' 45.0" E
-RP_C3- S 88° 52' 15.0" E
BEGIN BRIDGE
-L- STA. 263+89.28
POT Sta. 264+50.00 -L-=
POT Sta. 10+00.00 -RP_C3-
(47.00' RT)
Δ= 2° 18' 00.00"
TS Sta. 12+40.00
SC Sta. 14+40.00
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEETS 72 FOR -RP_C3- PROFILE

SEE SHEET 51 FOR -L- PROFILE


LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
PROJECT REFERENCE NO. R-2633B
SHEET NO. 22
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
REVISIONS
-Y8- (SR 1430) CEDAR HILL RD.
2009 ADT
2025 ADT
(ADT in hundreds)
MATCH TO SHEET 38 -Y8- STA.22+50.00
MATCH TO SHEET 38A -Y8B- STA.22+50.00
MATCH TO SHEET 21 -L- STA.270+00.00
MATCH TO SHEET 23 -L- STA.298+00.00
MATCH TO SHEET 39 -Y8- STA.37+00.00
NAD 83
A
C
D
BEGIN BRIDGE -L- STA. 280+69.69
END BRIDGE -L- STA. 282+14.61
PROPOSED GUARDRAIL
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH
NOTE: ALL DRIVEWAY RADII ARE TO 10', UNLESS OTHERWISE NOTED.
GRAPHIC SCALE
PLANS
SEE SHEET 76 FOR -Y8B- PROFILE
SEE SHEETS 51 & 52 FOR -L- PROFILE
SEE SHEETS 73 & 74 FOR -RP_D3- PROFILE
SEE SHEETS 68 & 69 FOR -Y8- PROFILE
SEE SHEET 75 FOR -SVRD8- PROFILE
SEE SHEET 75 FOR -SVRD9- PROFILE
SEE SHEET 72 FOR -LP_A3- PROFILE
SEE SHEET 71 FOR -RP_A3- PROFILE
SEE SHEETS 72 & 73 FOR -RP_C3- PROFILE
LOCATION: US 17 WILMINGTON BYPASS @ -Y8- CEDAR HILL ROAD (SR1430)
TIP NO.: R-2633B
COUNTY: BRUNSWICK
DESIGNED BY: Jeff R. Hext
CHECKED BY: Brian K. Eason
DATE: February 2005

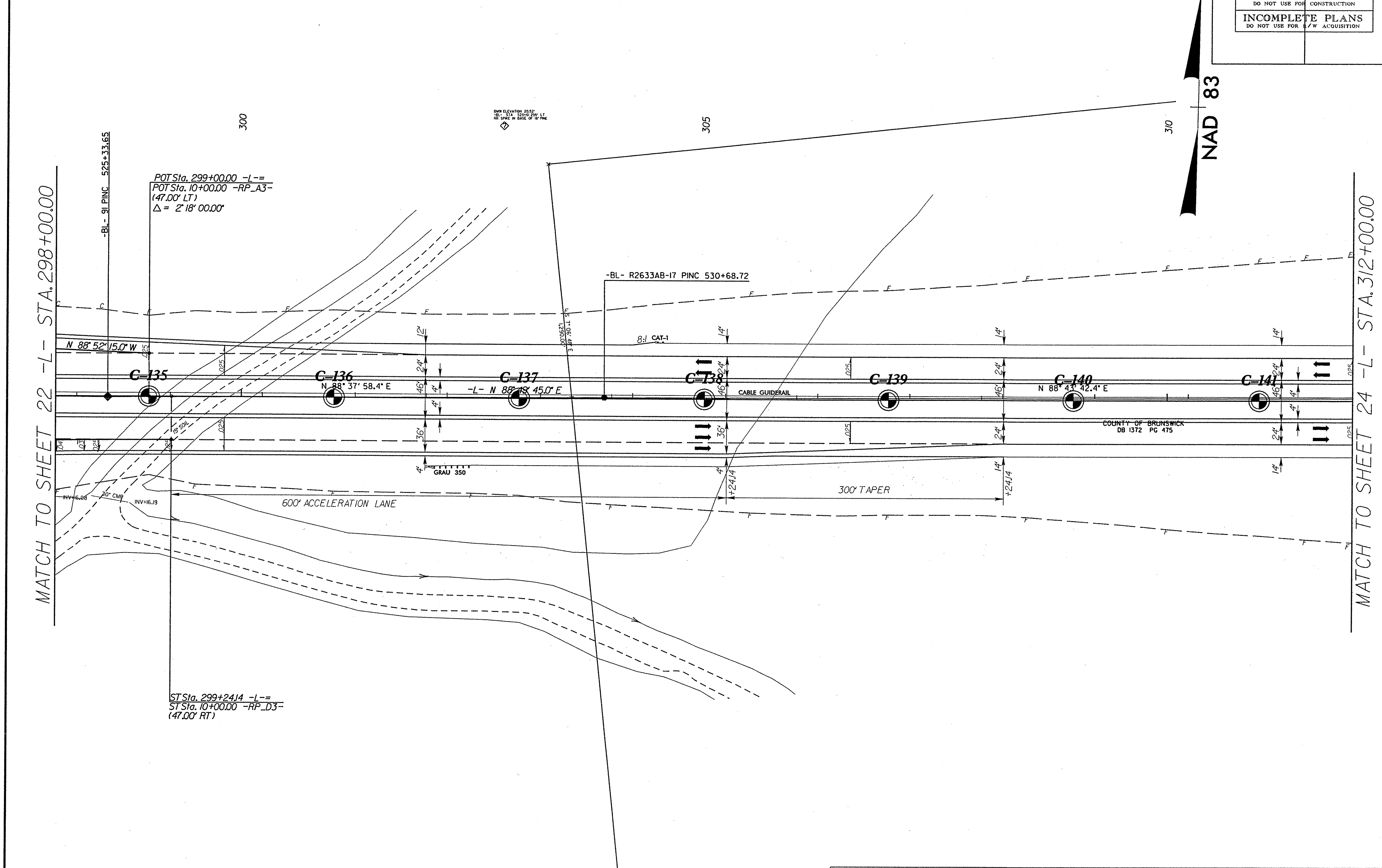
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
300
305
310
MATCH TO SHEET 22 -L- STA. 298+00.00
MATCH TO SHEET 24 -L- STA. 312+00.00
-BL- 91 PINC 525+33.65
POT Sta. 299+00.00 -L- =
POT Sta. 10+00.00 -RP_A3-
(47.00' LT)
△ = 2° 18' 00.00"
-BL- R2633AB-17 PINC 530+68.72
N 88° 52' 15.0" W
C-135
C-136
C-137
C-138
C-139
C-140
C-141
N 88° 37' 58.4" E
-L- N 88° 49' 45.0" E
N 88° 43' 42.4" E
8:1 CAT-1
CABLE GUIDERAIL
COUNTY OF BRUNSWICK
DB 1372 PG 475
GRAU 350
600' ACCELERATION LANE
300' TAPER
+24.14
30" CMP
INV=16.19
ST Sta. 299+24.14 -L- =
ST Sta. 10+00.00 -RP_D3-
(47.00' RT)

SEE SHEET 71 FOR -RP_A3- PROFILE | SEE SHEET 73 FOR -RP_D3- PROFILE | SEE SHEET 52 FOR -L- PROFILE

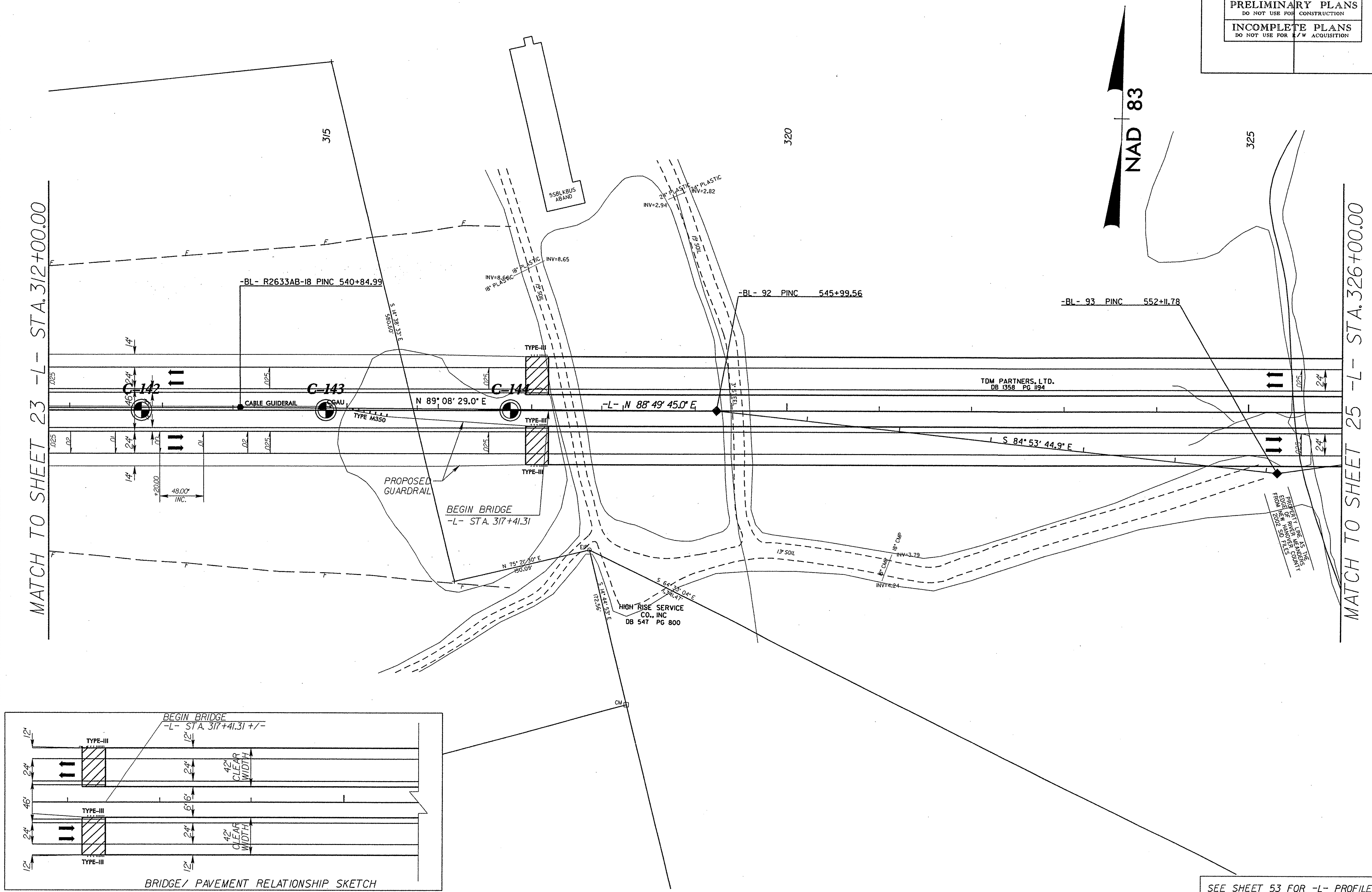
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
315
320
325
MATCH TO SHEET 23 -L- STA. 312+00.00
MATCH TO SHEET 25 -L- STA. 326+00.00
SSBLKBUS ABAND
-BL- R2633AB-18 PINC 540+84.99
-BL- 92 PINC 545+99.56
-BL- 93 PINC 552+11.78
C-142
C-143
C-144
CABLE GUIDERAIL
TYPE M350
N 89° 08' 29.0" E
-L- N 88° 49' 45.0" E
S 84° 53' 44.9" E
TYPE-III
TDM PARTNERS, LTD.
DB 1358 PG 1194
PROPOSED GUARDRAIL
BEGIN BRIDGE
-L- STA. 317+41.31
48.00' INC.
N 75° 21' 30" E
150.09'
HIGH RISE SERVICE CO., INC
DB 547 PG 800
PROPERTY LINE AS THE EDGE OF RIVER MEANDERS FROM NEW HANOVER COUNTY 2002 GIS FILES
INV=8.65
INV=2.94
INV=2.82
INV=3.79
INV=4.24
13" SOIL
BEGIN BRIDGE
-L- STA. 317+41.31 +/-
42' CLEAR WIDTH
BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEET 53 FOR -L- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

330

335

PROPERTY LINE AS THE EDGE OF RIVER MEANDERS FROM NEW HANOVER COUNTY 2002 SID FILES

-BL- 94 PINC 557+05.10

N 76° 28' 41.9" E

-L- N 88° 49' 45.0" E

N 80° 30' 16.9" E

CAPE FEAR RIVER

CITY OF WILMINGTON
DB 241PG 051

MATCH TO SHEET 24 -L- STA. 326+00.00

MATCH TO SHEET 26 -L- STA. 339+50.00

SEE SHEET 53 FOR -L- PROFILE

-L-
PI Sta. 383+94.77
Δ = 5° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

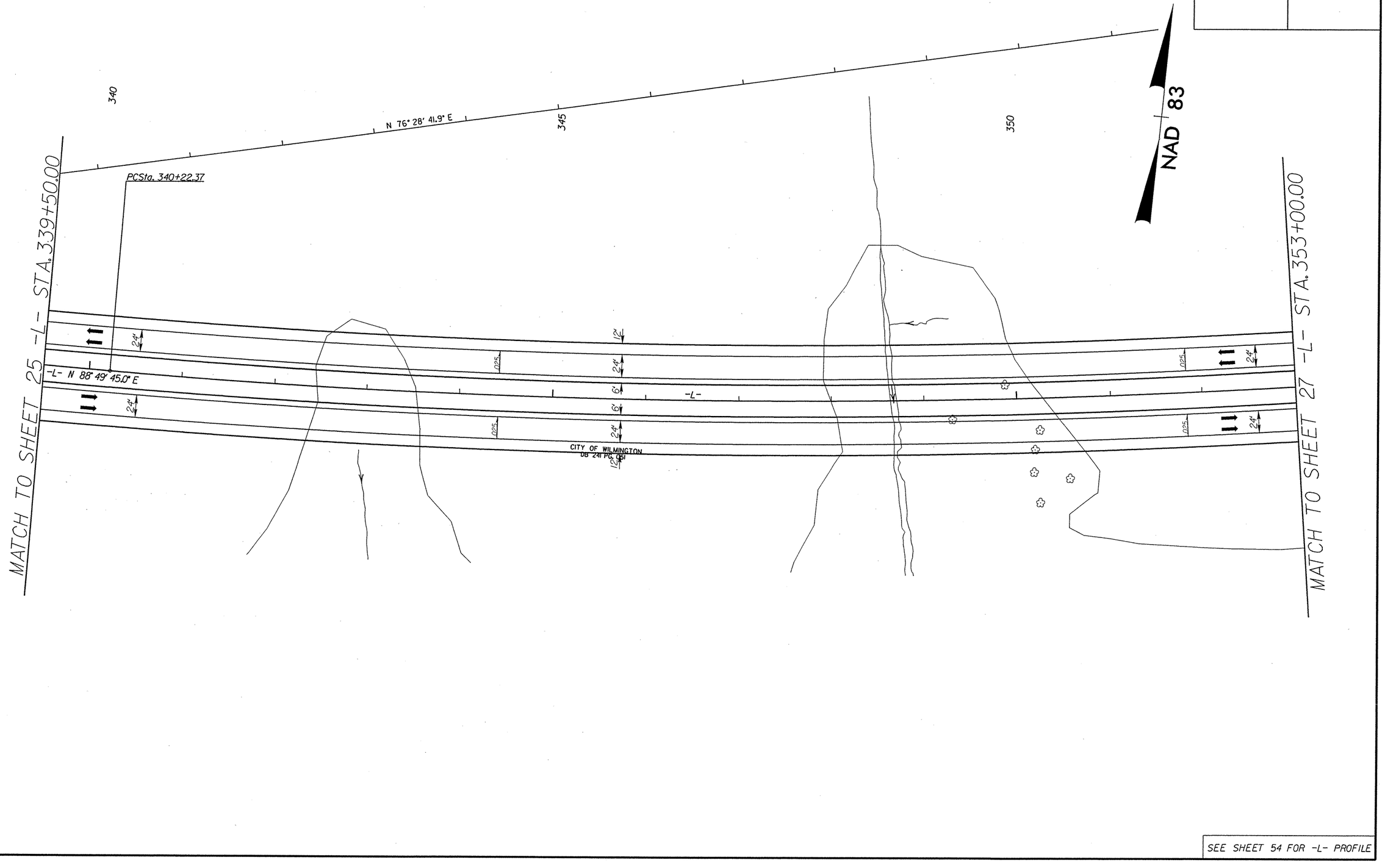
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



SEE SHEET 54 FOR -L- PROFILE

-L-
PI Sta 383+94.77
△ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

N 76° 28' 41.9" E

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

355 360 365

NAD 83

MATCH TO SHEET 26 -L- STA. 353+00.00

MATCH TO SHEET 28 -L- STA. 367+00.00

12' 24' .025 6' 6' 24' .025 12'

-L-

CITY OF WILMINGTON
BB-24HPB-051

SEE SHEET 54 FOR -L- PROFILE

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 383+94.77
△ = 5° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

N 76° 28' 41.9" E

370

375

S 63° 17' 54" E
388.19'

TOWERS CREEK

S 71° 08' 01" E
101.32'

S 18° 00' 54" E
222.28'

S 35° 15' 07" E
459.49'

-L-

MATCH TO SHEET 27 -L- STA. 367+00.00

MATCH TO SHEET 29 -L- STA. 380+00.00

12'
24'
6'
6'
24'
12'
.025

CITY OF WILMINGTON
DB 241 PG 051

CAROLINA POWER AND LIGHT CO.
DB 474 PG 502
DB 720 PG 420
DB 690 PG 555
DB 501 PG 407
DB 4134 PG 525
DB 886 PG 829
DB 880 PG 449
DB 1977 PG 643
DB 506 PG 066
DB 853 PG 865
MB 21 PG 56
MB 33 PG 362
MB 39 PG 210

NAD 83

SEE SHEET 55 FOR -L- PROFILE

-L-
PI Sta 383+94.77
△ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

385
390
NAD 83

MATCH TO SHEET 28 -L- STA. 380+00.00

N 76° 28' 41.9" E

-BL- 96 PINC 613+15.60

-BL- 97 PINC 618+66.64

PROPOSED GUARDRAIL

TYPE-III

C-145

C-146

C-147

N 57° 59' 59.7" E

TYPE M350

CGAU

CABLE GUIDERAIL

-L-

24'
.025
14'
46'
4'

CAROLINA POWER AND LIGHT CO.
DB 474 PG 502
DB 720 PG 420
DB 690 PG 555
DB 501 PG 407
DB 4134 PG 525
DB 886 PG 829
DB 880 PG 449
DB 1977 PG 643
DB 506 PG 066
DB 853 PG 865
MB 21 PG 56
MB 33 PG 362
MB 39 PG 210

END BRIDGE
-L- STA. 389+24.54

MATCH TO SHEET 30 -L- STA. 393+00.00

BM96 ELEVATION 7.55'
-BL- STA 594+45 75' RT
RR SPIKE IN BASE OF 24" TWIN OAK

END BRIDGE
-L- STA. 389+24.54 +/-

12'
24'
42' CLEAR WIDTH
6'
46'

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEET 55 FOR -L- PROFILE

-L-
PI Sta 383+94.77
Δ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	30
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

MATCH TO SHEET 28 -L- STA. 393+00.00

MATCH TO SHEET 31 -L- STA. 406+40.00

395 400 405

S 15° 13' 19.7" E

-BY9A- 263
PINC 9+52.22

S 18° 14' 42.2" E

BEGIN BRIDGE
-L- STA. 397+91.42

-BL- 98 PINC 629+99.09

C-147 C-148 C-150 C-151 C-152 C-153 C-154

CABLE GUIDERAIL CGAU TYPE M350 TYPE-III GRAU 350 8:1 CAT-1 8:1

PROPOSED GUARDRAIL

N 73° 51' 40.2" E

N 24° 06' 24.7" E

N 48° 16' 21.3" E

END BRIDGE
-L- STA. 399+90.59

-BL- R2633AB-14 PINC 624+88.30

-BY9A- R2633AB-14 PINC 14+03.21

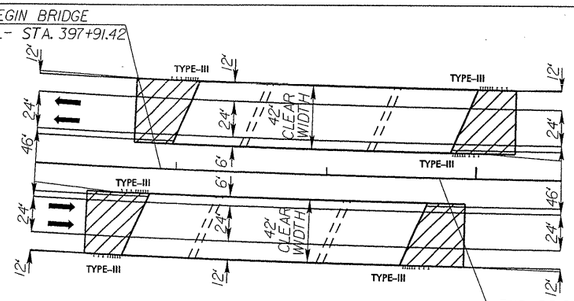
S 31° 25' 31.4" E

EXISTING GAS ROAD R/W

100.00'

Bmk ELEVATION 17.24'
-BY9A- STA 13+55 07' RT
NR SPIKE SET IN THE BASE OF A 12" PINE

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH



SEE SHEET 56 FOR -L- PROFILE

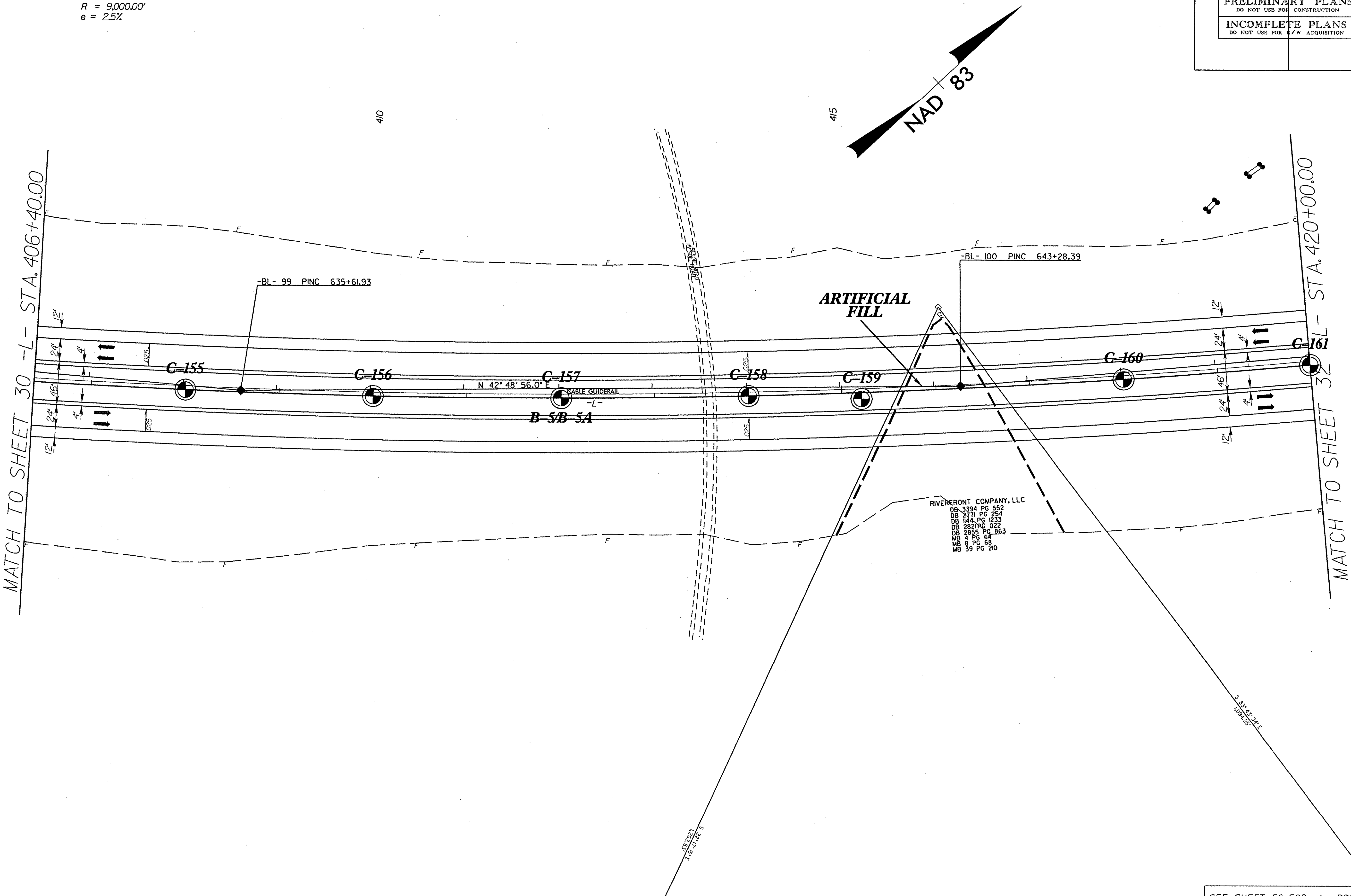
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

-L-
PI Sta 383+94.77
Δ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%



SEE SHEET 56 FOR -L- PROFILE

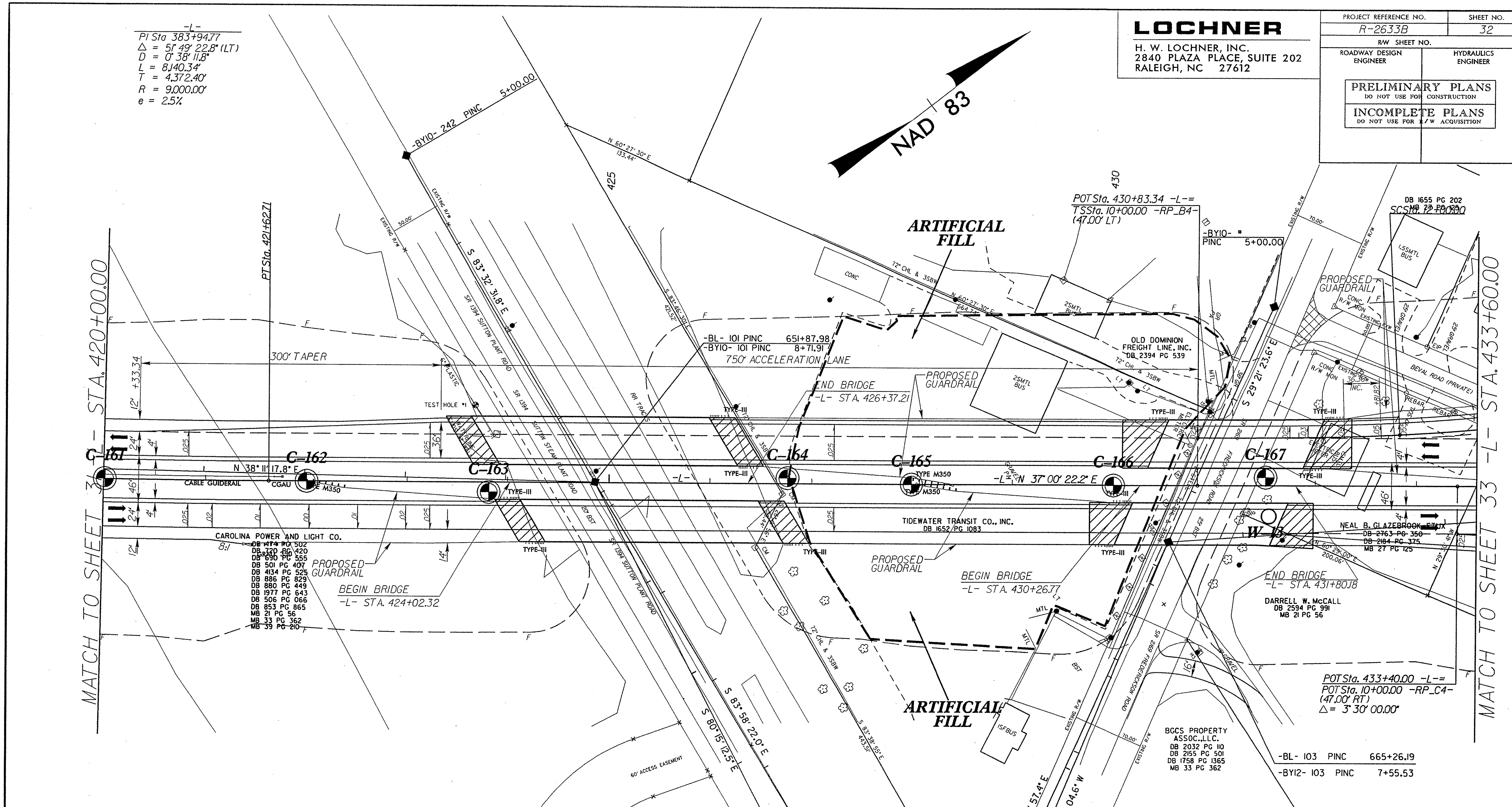
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

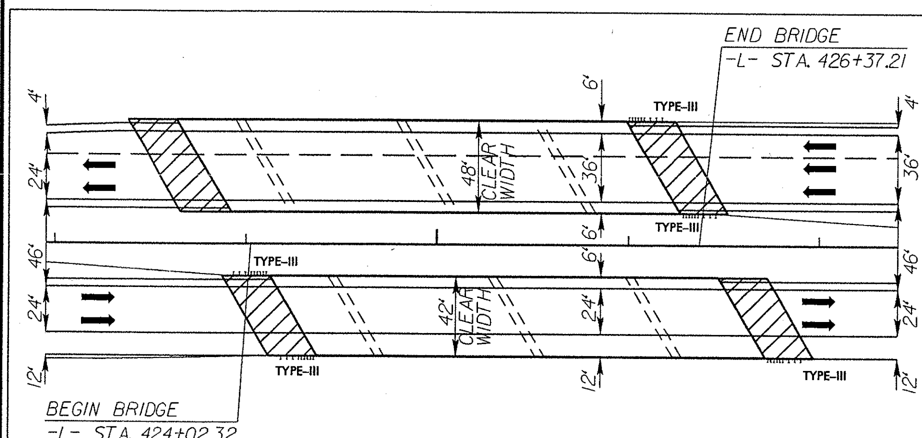
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

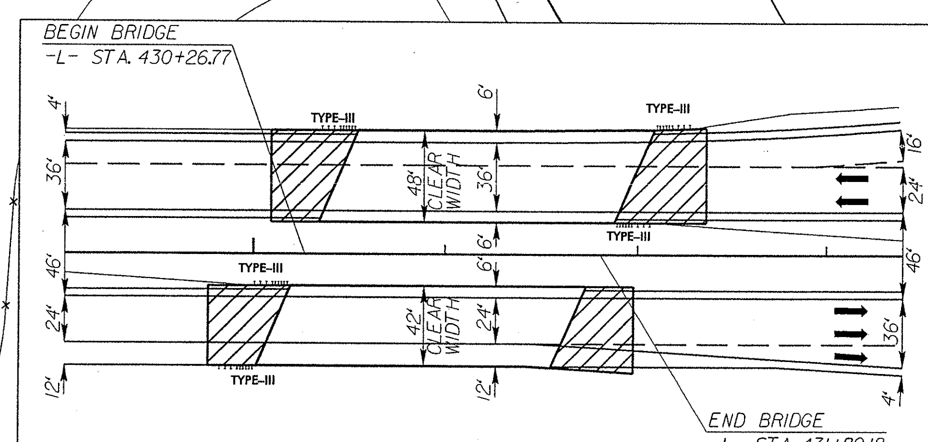
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-
PI Sta 383+94.77
Δ = 51° 49' 22.8" (LT)
D = 0° 38' 11.8"
L = 8,140.34'
T = 4,372.40'
R = 9,000.00'
e = 2.5%


NAD 83
MATCH TO SHEET 31 -L- STA. 420+00.00
MATCH TO SHEET 33 -L- STA. 433+60.00
ARTIFICIAL FILL
300' TAPER
750' ACCELERATION LANE
-BL- 101 PINC 651+87.98
-BY10- 101 PINC 8+71.91
-BY10- 242 PINC 5+00.00
POT Sta. 430+83.34 -L-=
TS Sta. 10+00.00 -RP_B4-
(47.00' LT)
-BY10- PINC 5+00.00
PT Sta. 421+62.71
N 38° 11' 17.8" E
-L- N 37° 00' 22.2" E
S 83° 32' 31.8" E
S 83° 58' 22.0" E
S 80° 15' 12.5" E
S 29° 21' 23.6" E
S 28° 33' 57.4" E
N 30° 09' 04.6" W
C-161
C-162
C-163
C-164
C-165
C-166
C-167
W-13
END BRIDGE
-L- STA. 426+37.21
BEGIN BRIDGE
-L- STA. 424+02.32
BEGIN BRIDGE
-L- STA. 430+26.77
END BRIDGE
-L- STA. 431+80.18
PROPOSED GUARDRAIL
CABLE GUIDERAIL
CAROLINA POWER AND LIGHT CO.
TIDEWATER TRANSIT CO., INC.
DB 1652 PG 1083
OLD DOMINION FREIGHT LINE, INC.
DB 2394 PG 539
NEAL B. GLAZEBROOK, ETUX
DB 2763 PG 350
DB 2184 PG 375
MB 27 PG 125
DARRELL W. McCALL
DB 2594 PG 991
MB 21 PG 56
BGCS PROPERTY ASSOC., LLC.
DB 2032 PG 110
DB 2155 PG 501
DB 1758 PG 1365
MB 33 PG 362
DB 1655 PG 202
SR 1394 SUTTON STEAM PLANT ROAD
SR 2169 FREDERICKSON ROAD
BEVAL ROAD (PRIVATE)
60' ACCESS EASEMENT
POT Sta. 433+40.00 -L-=
POT Sta. 10+00.00 -RP_C4-
(47.00' RT)
Δ = 3° 30' 00.00"
-BL- 103 PINC 665+26.19
-BY12- 103 PINC 7+55.53



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEET 78 FOR -Y1- PROFILE	SEE SHEET 75 FOR -RAMP B4- PROFILE
SEE SHEET 57 FOR -L- PROFILE	SEE SHEET 76 FOR -RAMP C4- PROFILE

REVISIONS

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

MATCH TO SHEET 32 -L- STA 433+60.00

NAD '83

B
ROADWAY EMBANKMENT FILL

*NOTE: CONSTRUCTED UNDER TIP# R-2633CA

NOTE: ALL DRIVEWAY RADII ARE TO 17, UNLESS OTHERWISE NOTED.

SEE SHEET 57 FOR -L- PROFILE
SEE SHEET 79 FOR -Y1- PROFILE
SEE SHEET 77 FOR -RAMP B4- PROFILE
SEE SHEET 78 FOR -RAMP C4- PROFILE

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: US 17 WILMINGTON BYPASS @ US 421	
TIP NO.: R-2633B	COUNTY: NEW HANOVER
DESIGNED BY: Jeff R. Hext	
CHECKED BY: Brian K. Eason	DATE: November 2005

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

-Y1- (US 421)
2009 ADT
2025 ADT
(ADT in hundreds)

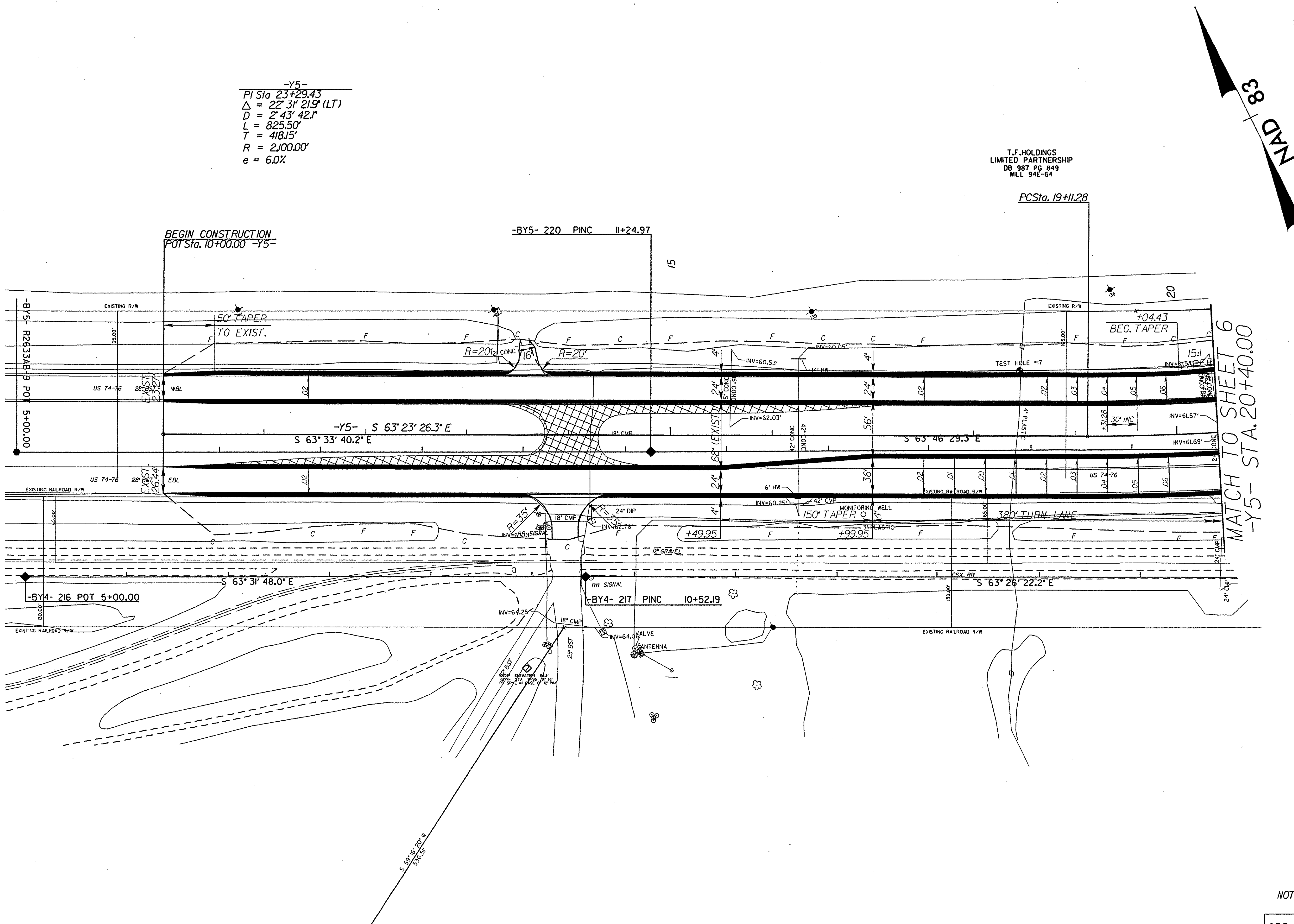
LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



NAD 83
-Y5-
PI Sta 23+29.43
Δ = 22° 31′ 21.9″ (LT)
D = 2° 43′ 42.1″
L = 825.50′
T = 418.15′
R = 2,100.00′
e = 6.0%
T.F. HOLDINGS LIMITED PARTNERSHIP
DB 987 PG 849
WILL 94E-64
PCSta. 19+11.28
BEGIN CONSTRUCTION
POT Sta. 10+00.00 -Y5-
-BY5- 220 PINC 11+24.97
-BY5- R2633A 8-9 POT 5+00.00
50′ TAPER TO EXIST.
+04.43
BEG. TAPER
15:1
TEST HOLE #17
EXISTING R/W
US 74-76
WBL
EBL
-Y5- S 63° 23′ 26.3″ E
S 63° 33′ 40.2″ E
S 63° 46′ 29.3″ E
68′ (EXIST)
56′
36′
24′
R=20′
R=35′
150′ TAPER
380′ TURN LANE
+49.95
+99.95
MONITORING WELL
EXISTING RAILROAD R/W
S 63° 31′ 48.0″ E
S 63° 26′ 22.2″ E
-BY4- 216 POT 5+00.00
-BY4- 217 PINC 10+52.19
RR SIGNAL
VALVE
ANTENNA
MATCH TO SHEET 6
-Y5- STA. 20+40.00

NOTE: ALL DRIVEWAY RADII ARE TO BE 10′, UNLESS OTHERWISE NOTED.

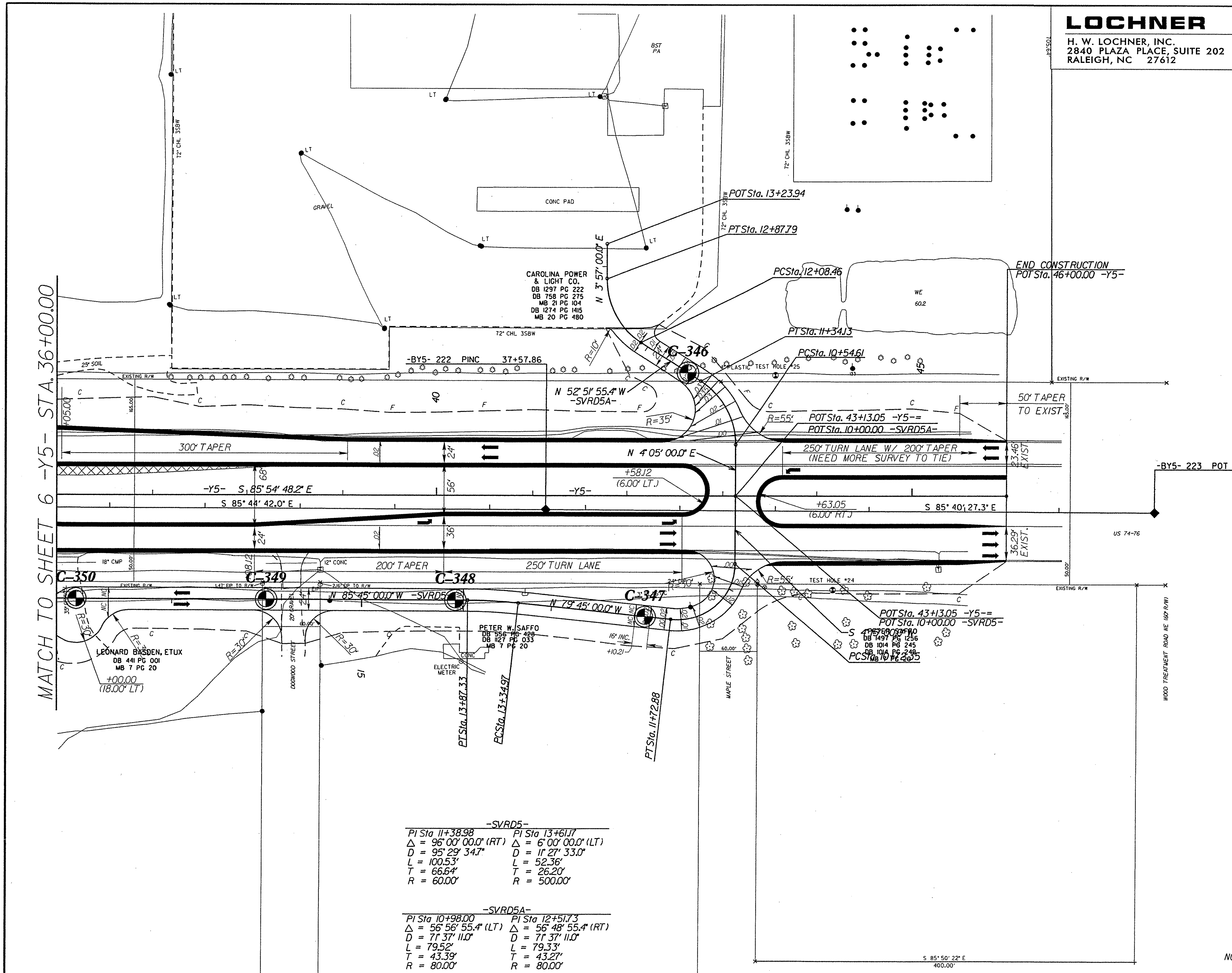
SEE SHEETS 58 & 59 FOR -Y5- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	35
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



-SVRD5-

PI Sta 11+38.98	PI Sta 13+61.17
Δ = 96° 00' 00.0" (RT)	Δ = 6° 00' 00.0" (LT)
D = 95° 29' 34.7"	D = 11° 27' 33.0"
L = 100.53'	L = 52.36'
T = 66.64'	T = 26.20'
R = 60.00'	R = 500.00'

-SVRD5A-

PI Sta 10+98.00	PI Sta 12+51.73
Δ = 56° 56' 55.4" (LT)	Δ = 56° 48' 55.4" (RT)
D = 71° 37' 11.0"	D = 71° 37' 11.0"
L = 79.52'	L = 79.33'
T = 43.39'	T = 43.27'
R = 80.00'	R = 80.00'

NOTE: ALL DRIVEWAY RADII ARE TO BE 10'. UNLESS OTHERWISE NOTED.

SEE SHEET 62 FOR -SVRD5A- PROFILE | SEE SHEET 62 FOR -SVRD5- PROFILE | SEE SHEETS 58 & 59 FOR -Y5- PROFILE

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

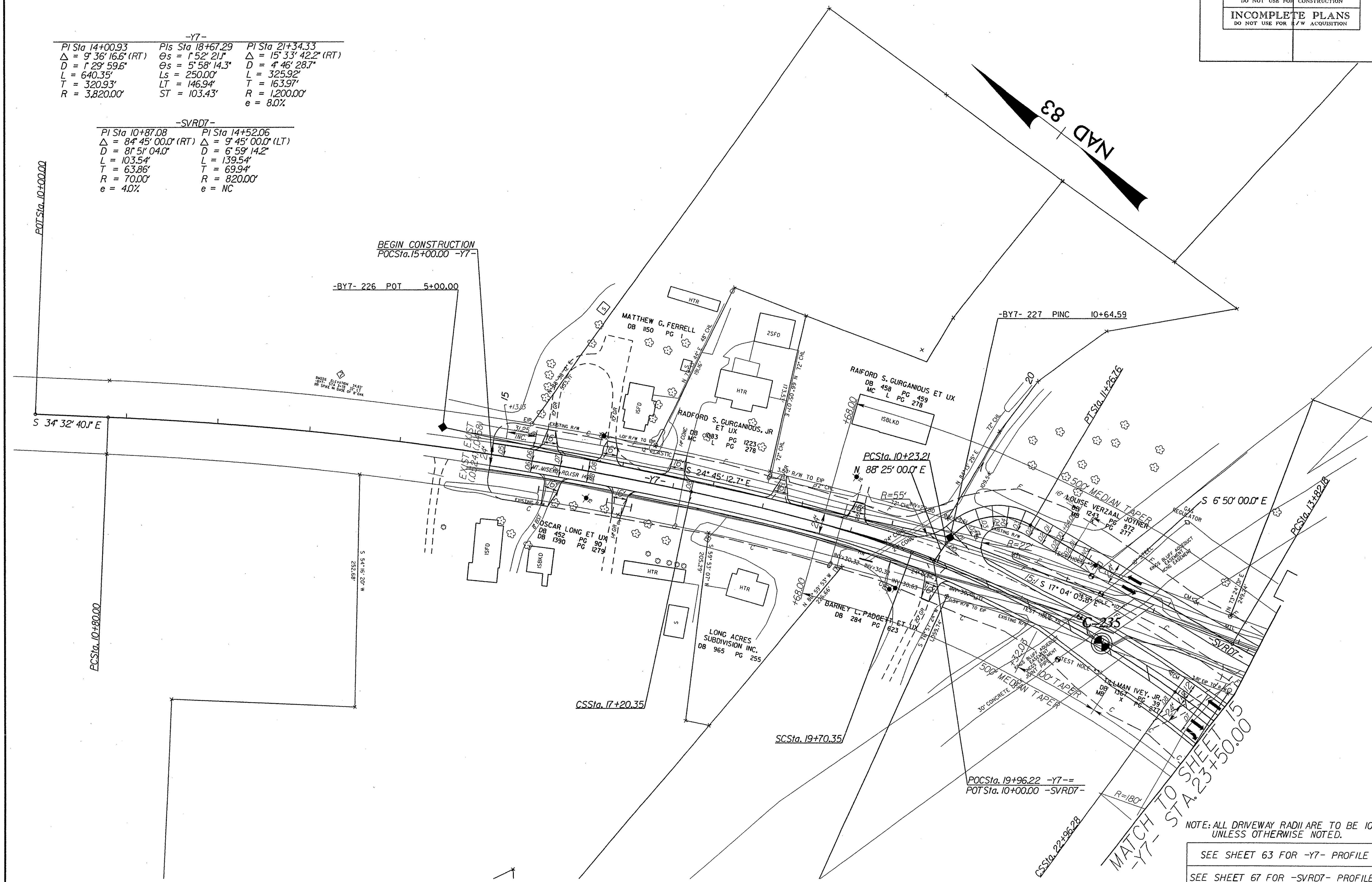
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y7-

PI Sta 14+00.93	PIs Sta 18+67.29	PI Sta 21+34.33
Δ = 9° 36' 16.6" (RT)	Θs = 1° 52' 21.1"	Δ = 15° 33' 42.2" (RT)
D = 1° 29' 59.6"	Θs = 5° 58' 14.3"	D = 4° 46' 28.7"
L = 640.35'	Ls = 250.00'	L = 325.92'
T = 320.93'	LT = 146.94'	T = 163.97'
R = 3,820.00'	ST = 103.43'	R = 1,200.00'
		e = 8.0%

-SVRD7-

PI Sta 10+87.08	PI Sta 14+52.06
Δ = 84° 45' 00.0" (RT)	Δ = 9° 45' 00.0" (LT)
D = 81° 51' 04.0"	D = 6° 59' 14.2"
L = 103.54'	L = 139.54'
T = 63.86'	T = 69.94'
R = 70.00'	R = 820.00'
e = 4.0%	e = NC



NAD 83
POTSta. 10+00.00
S 34° 32' 40.1" E
PCSta. 10+80.00
BEGIN CONSTRUCTION
POCSta. 15+00.00 -Y7-
-BY7- 226 POT 5+00.00
MATTHEW G. FERRELL
DB 1150 PG
RADFORD S. GURGANIOUS, JR ET UX
RAIFORD S. GURGANIOUS ET UX
OSCAR LONG ET UX
LONG ACRES SUBDIVISION INC.
DB 965 PG 255
BARNEY L. PADGETT ET UX
LOUISE VERZAAL JOYNER
LILLMAN IVEY, JR.
-Y7-
S 24° 45' 12.7" E
-BY7- 227 PINC 10+64.59
PCSta. 10+23.21
N 88° 25' 00.0" E
S 6° 50' 00.0" E
S 17° 04' 03.8" E
PTSta. 11+26.76
PCSta. 13+82.18
500' MEDIAN TAPER
C-235
-SVRD7-
CSSta. 17+20.35
SCSta. 19+70.35
POCSta. 19+96.22 -Y7-=
POTSta. 10+00.00 -SVRD7-
CSSta. 22+96.28
MATCH TO SHEET 15
-Y7- STA. 23+50.00

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEET 63 FOR -Y7- PROFILE

SEE SHEET 67 FOR -SVRD7- PROFILE

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

-BY7- 228 PINC 37+04.48

-BY7- R2633AB-10 PINC 31+46.15
-BY7A- R2633AB-10 POT 5+00.00

PCSta. 38+62.38

PTSta. 39+26.03

S 83° 37' 30.0" W

-BY7- 229 POT 45+21.81

WILLIE A. BEATTY, JR. ET UX
DB 420 PG 138

DONALD BEATTY ET UX
DB 610 PG 239

MAINTENANCE, INC.
DB 1269 PG 1274

E. G. DALE ET UX
DB 1199 PG 1172
DB 1845 PG26
MB 6 PG 127

E. G. DALE ET UX
DB 1199 PG 1172
DB 1845 PG26
MB 6 PG 127

ANNETTE ANDREWS TROY ET AL
DB 450 PG 599

ALMA SOOBRIAN GORE
DB 639 PG 465
MB 0 PG 174

S 12° 44' 26.7" W

S 10° 41' 34.0" W

S 9° 29' 28.0" W

-SVRD8-

C-249

C-247

C-246 -Y7-

C-245

200' MEDIAN TAPER

700' LANE TAPER

130' TAPER

S 9° 30' 00.0" E

N 59° 58' 00" W

N 68° 27' 01" W

R=30'

+20.00
(20.00' RT)

MATCH TO SHEET 15
-Y7- STA. 39+50.00

MATCH TO INSET AA THIS SHEET

MATCH TO INSET AA THIS SHEET

ST Sta. 53+86.32

POC Sta. 48+00.00 -Y7-=
POT Sta. 39+64.06 -SVRD8-

SC Sta. 48+15.80

TS Sta. 48+05.80

PT Sta. 43+15.29

CS Sta. 51+76.32

POT Sta. 56+28.44

MEBANE
MB 17 PG 504

NORTH CAROLINA AGRICULTURAL FOUNDATION, INC
DB 1527 PG 1070
MB 25 PG 202

END CONSTRUCTION
TIE TO EXISTING
NORTH CAROLINA 55+00.00 -Y7-

ORGANIC OR LOOSE SOILS

-Y7-

PI Sta 36+19.17	PIs Sta 47+45.84	PI Sta 49+96.80	PIs Sta 52+46.35
Δ = 13° 58' 00.0" (LT)	θs = 3° 41' 27.0"	Δ = 12° 40' 20.5" (RT)	θs = 3° 41' 27.0"
D = 0° 59' 53.5"	Ls = 210.00'	D = 3° 30' 54.3"	Ls = 210.00'
L = 1,399.21'	LT = 140.03'	L = 360.51'	LT = 140.03'
T = 703.09'	ST = 70.03'	T = 181.00'	ST = 70.03'
R = 5,740.00'		R = 1,630.00'	
e = 2.5%		e = 7.0%	

-SVRD8-

PI Sta 38+99.33
Δ = 72° 55' 56.0" (RT)
D = 114° 35' 29.6"
L = 63.65'
T = 36.95'
R = 50.00'
e = 4.0%

NOTE: ALL DRIVEWAY RADII ARE TO BE 10', UNLESS OTHERWISE NOTED.

SEE SHEETS 67 & 68 FOR -SVRD8- PROFILE | SEE SHEETS 63 & 64 FOR -Y7- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER

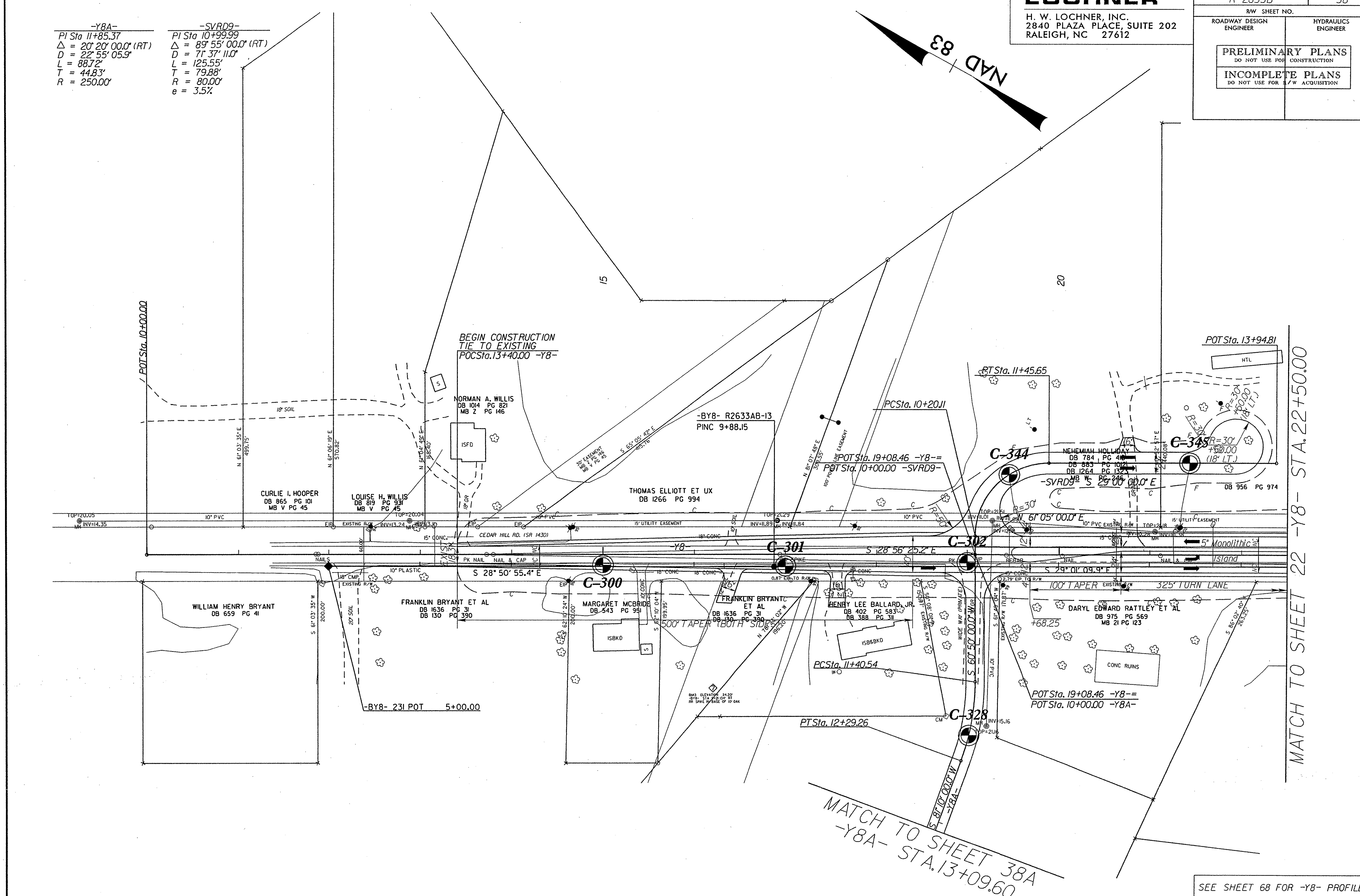
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y8A-
PI Sta 11+85.37
Δ = 20° 20' 00.0" (RT)
D = 22° 55' 05.9"
L = 88.72'
T = 44.83'
R = 250.00'

-SVRD9-
PI Sta 10+99.99
Δ = 89° 55' 00.0" (RT)
D = 71° 37' 11.0"
L = 125.55'
T = 79.88'
R = 80.00'
e = 3.5%



NAD 83
BEGIN CONSTRUCTION
TIE TO EXISTING
POCSta. 13+40.00 -Y8-
POT Sta. 10+00.00
NORMAN A. WILLIS
DB 1014 PG 821
MB Z PG 146
CURLIE I. HOOPER
DB 865 PG 101
MB V PG 45
LOUISE H. WILLIS
DB 819 PG 931
MB V PG 45
THOMAS ELLIOTT ET UX
DB 1266 PG 994
-BY8- R2633AB-13
PINC 9+88.15
CEDAR HILL RD. (SR 1430)
-Y8-
S 28° 50' 55.4" E
S 28° 56' 25.2" E
S 29° 01' 09.9" E
C-300
C-301
C-302
C-344
C-348
C-328
WILLIAM HENRY BRYANT
DB 659 PG 41
FRANKLIN BRYANT ET AL
DB 1636 PG 31
DB 130 PG 390
MARGARET MCBRIDE
DB 543 PG 951
FRANKLIN BRYANT
ET AL
DB 1636 PG 31
DB 130 PG 390
HENRY LEE BALLARD, JR.
DB 402 PG 583
DB 388 PG 311
DARYL EDWARD RATTLEY ET AL
DB 975 PG 569
MB 21 PG 123
NEHEMIAH HOLLIDAY
DB 784 PG 411
DB 883 PG 1012
DB 1264 PG 132
MB W PG 246
DB 956 PG 974
PCSta. 10+20.11
PT Sta. 11+45.65
POT Sta. 19+08.46 -Y8-=
POT Sta. 10+00.00 -SVRD9-
-SVRD9- S 29° 00' 00.0" E
N 61° 05' 00.0" E
POT Sta. 13+94.81
100' TAPER
325' TURN LANE
500' TAPER (BOTH SIDES)
5" Monolithic Island
PCSta. 11+40.54
PT Sta. 12+29.26
POT Sta. 19+08.46 -Y8-=
POT Sta. 10+00.00 -Y8A-
S 60° 50' 00.0" W
S 81° 10' 00.0" W
-Y8A-
WIDE WAY (PRIVATE)
-BY8- 231 POT 5+00.00
CONC RUINS
MATCH TO SHEET 38A
-Y8A- STA. 13+09.60
MATCH TO SHEET 22 -Y8- STA. 22+50.00

SEE SHEET 68 FOR -Y8- PROFILE

SEE SHEET 76 FOR -Y8A- PROFILE

SEE SHEET 75 FOR -SVRD9- PROFILE

NOTE: ALL DRIVEWAY RADII ARE TO 10'. UNLESS OTHERWISE NOTED.

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	38A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

NOTE: NEED SURVEYS IN THIS AREA TO COMPLETE DESIGN.

POT Sta. 25+27.59

POT Sta. 14+38.53 -Y8A-=
POT Sta. 10+00.00 -Y8B-

C-334 C-333 C-332 C-331 C-330 C-329

S 38°10' 00.0" W
-Y8A-

20'

R=30'

R=30'

S 9° 05' 00.2" E
-Y8B-

C-335

25

20

15

12'

FIB

MATCH TO SHEET 38
-Y8A- STA. 13+09.60

MATCH TO SHEET 22
-Y8B- STA. 22+50.00

SEE SHEET 76 FOR -Y8A- PROFILE
SEE SHEET 76 FOR -Y8B- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	39
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83

MATCH TO SHEET 22 -Y8- STA. 37+00.00

-BY8- 233 PINC 30+64.91

-BY8- 234 PINC 37+84.91
-BY9- 234 POT 14+46.54

-SVRD10-
PI Sta 13+57.98
Δ = 94° 45' 00.0" (RT)
D = 57° 17' 44.8"
L = 165.37'
T = 108.65'
R = 100.00'
e = 4.0%

-Y8-
PI Sta 43+19.33
Δ = 2° 12' 58.0" (RT)
D = 0° 22' 55.1"
L = 580.18'
T = 290.12'
R = 15,000.00'
e = NC

-Y9-
PI Sta 13+54.45
Δ = 12° 56' 55.2" (RT)
D = 3° 57' 05.2"
L = 327.10'
T = 164.55'
R = 1,450.00'
e = 4.0%

PCSta. 40+29.20

POCSta. 43+82.30 -Y8-=
POTSta. 10+00.00 -SVRD10-
POTSta. 10+00.00 -Y9-
N 70° 00' 00.0" E

PCSta. 11+89.90

PCSta. 12+49.33

PTSta. 14+14.70

S 19° 24' 00.0" E

PROPOSED GUARDRAIL
PTSta. 46+09.38

END CONSTRUCTION
TIE TO EXISTING
POT Sta. 16+50.00

PTSta. 15+17.60

MATCH TO SHEET 40
-Y8- STA. 46+50.00

C-310 C-311 C-312 C-336 C-337 C-339 C-340 C-341 C-342

SEE SHEET 75 FOR -SVRD10- PROFILE
SEE SHEET 74 FOR -Y9- PROFILE
SEE SHEET 69 FOR -Y8- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y8-
PIs Sta 52+68.24
Θs = 7° 27' 37.4"
Ls = 250.00'
LT = 166.81'
ST = 83.47'

PI Sta 57+60.90
Δ = 46° 12' 00.0" (LT)
D = 5° 58' 05.9"
L = 774.09'
T = 409.47'
R = 960.00'
e = 8.0%

NAD 83

MATCH TO SHEET 39 -Y8- STA. 46+50.00

MATCH TO SHEET 41 -Y8- STA. 59+50.00

BEGIN BRIDGE
-Y8- STA. 47+20.00

END BRIDGE
-Y8- STA. 50+40.00

TSSta. 51+01.42

SCSta. 53+51.42

-BY8- 235 PINC 45+51.06

ESTATE OF ESSIE E. BLIZZARD
DB 1604 PG 151
MB 4 PG 37

LINCOLN DEVELOPEMENT COMPANY, INC.
DB 284 PG 662

S 19° 24' 00.0" E

S 10° 46' 33.5" E

S 59° 43' 40.4" E

PROPOSED GUARDRAIL

C-316 C-317 C-318 C-319 C-320

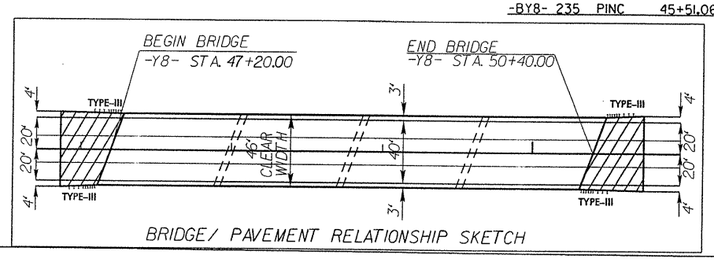
GRAU 350

TYPE-III

10" PVC

10" PLASTIC

30" CONCRETE LOCK JOINT PIPE



BRIDGE/ PAVEMENT RELATIONSHIP SKETCH

SEE SHEETS 69 & 70 FOR -Y8- PROFILE

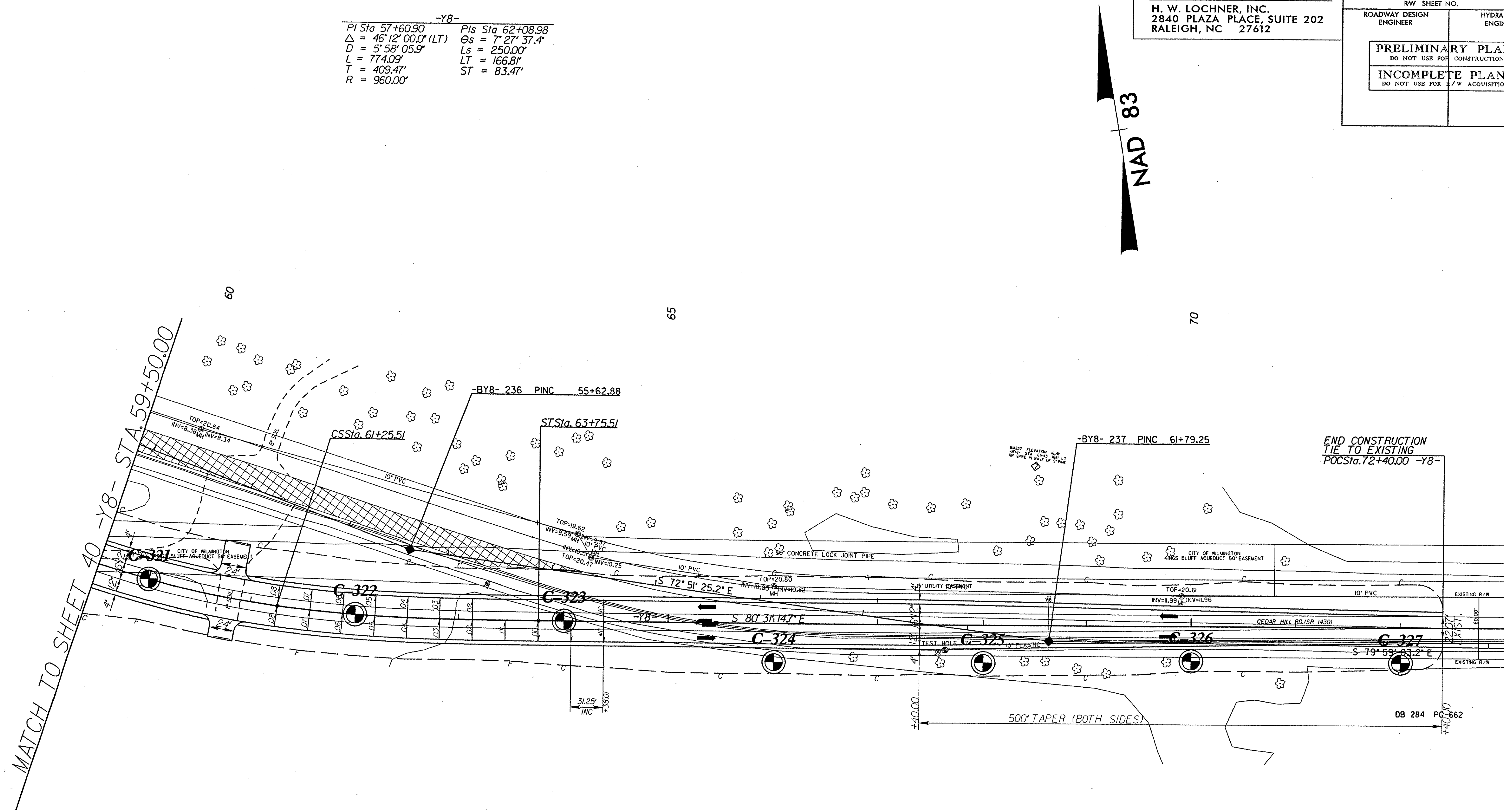
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y8-
PI Sta 57+60.90
Δ = 46° 12' 00.0" (LT)
D = 5° 58' 05.9"
L = 774.09'
T = 409.47'
R = 960.00'
PIs Sta 62+08.98
Θs = 7° 27' 37.4"
Ls = 250.00'
LT = 166.81'
ST = 83.47'



NAD 83
MATCH TO SHEET 40 -Y8- STA.59+50.00
-BY8- 236 PINC 55+62.88
ST Sta. 63+75.51
CS Sta. 61+25.51
-BY8- 237 PINC 61+79.25
END CONSTRUCTION
TIE TO EXISTING
POC Sta.72+40.00 -Y8-
C-321
C-322
C-323
C-324
C-325
C-326
C-327
S 72° 51' 25.2" E
S 80° 31' 14.7" E
S 79° 59' 03.2" E
CITY OF WILMINGTON KINGS BLUFF AQUEDUCT 50' EASEMENT
CONCRETE LOCK JOINT PIPE
10" PVC
CEDAR HILL RD.(SR 1430)
EXISTING R/W
500' TAPER (BOTH SIDES)
DB 284 PG 662
31.25' INC
TEST HOLE

SEE SHEET 70 FOR -Y8- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

BEGIN GRADE
STATE PROJECT R-2633B
-L- STA 24+00.00
EL = 83.89'

PI = 33+80.00
EL = 109.93'
VC = 1,300'
K = 247

(+)2.6565%

(-)2.6035%

PROPOSED GRADE LINE

01 CONSTRUCTION SLOPE

C-1 24+00 CL -L-

C-2 25+00 CL -L-

C-3 28+00 CL -L-

C-4 30+00 CL -L-

C-5 32+00 CL -L-

C-6 34+00 CL -L-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
WITH CLAY LAYERS
(M - SAT.)

SOFT TO MEDIUM STIFF SILTY CLAY (M)

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
WITH CLAY LAYERS
(M - SAT.)

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY LOOSE
SILTY FINE TO COARSE SAND
WITH CLAY LAYERS
(M - SAT.)

SEE SHEET 5 FOR -L- PLANVIEW

-L-

BEGIN BRIDGE
-L- STA.34+87.28

BM56 ELEVATION 69.37'
-L- STA 35+07.17 173.05' RT
RR SPIKE IN BASE 8" OF PINE

PI = 33+80.00
EL = 109.93'
VC = 1,300'
K = 247

EXIST BR

END BRIDGE
-L- STA.40+75.00

PI = 45+20.00
EL = 80.25'
VC = 450'
K = 195

(-)2.6035%

(-)10.3000%

C-6 34+00 CL -L-

C-7 35+00 CL -L-

C-8 41+00 CL -L-

C-10 45+00 CL -L-

C-11 47+00 CL -L-

-L- STA. 39+68.15

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
WITH CLAY LAYERS
(M - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
WITH CLAY LAYERS
(M - SAT.)

SOFT TO STIFF SILTY CLAY (M)

MEDIUM STIFF TO STIFF SILTY CLAY (M)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE
MODERATELY ORGANIC, BLACK SILTY COARSE TO FINE SAND (SAT.)

S-1

SEE SHEET 6 FOR -L- PLANVIEW

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-1	47+00	0 ft CL	-L-	0.0 - 2.5	A-2-4 (0)	25	NP	19	59	14	8	99	93	80	22		6.6

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM59 ELEVATION 69.63'
-L- STA 59+09.46 99.95' RT
RR SPIKE IN BASE OF 10" PINE

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-1	55+00	0 ft CL	-L-	1.0 - 1.5	365	261
HVS-2	57+00	0 ft CL	-L-	1.0 - 1.5	804	104
HVS-3	59+00	0 ft CL	-L-	1.0 - 1.5	856	251

PI = 62+00.00
EL = 75.21'
VC = 300'
K = 250

-L-

(-)0.3000%

C-13
51+00
CL -L-

B-1/B-1A
51+00
CL -L-
SS-1
SS-2
ST-1
ST-2
PPDT-1

PROPOSED GRADE LINE

C-12
49+00
CL -L-

HA-1
50+00
CL -L-
S-2

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE DARK GRAY MODERATELY ORGANIC SILTY COARSE TO FINE SAND (SAT)

MEDIUM DENSE BROWN MODERATELY ORGANIC COARSE TO FINE SAND WITH TRACE OF SILT AND CLAY (SAT)

C-14
53+00
CL -L-

EXISTING GROUND PROFILE

HARD TO SOFT GRAY SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LAYERS (M - SAT)

C-15
55+00
CL -L-
HVS-1
S-3

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE BLACK SILTY COARSE TO FINE SAND WITH LITTLE ORGANICS (SAT)

C-16
57+00
CL -L-
HVS-2

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY SOFT BLACK FINE SANDY SILT WITH LITTLE ORGANICS (W)

C-17
59+00
CL -L-
HVS-3

VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LAYERS (M - SAT)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LINERS (M - SAT)

PPDT-1

ST-1/ST-2

SOFT TO MEDIUM STIFF GRAY SILTY CLAY WITH SANDY SILT LAYERS (W)

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOL.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	C_v (ft^2/day)	t_{50} (min)	Φ (Degrees)	c_u (psi)	Φ (Degrees)	c' (psi)
S-2	50+00	0 ft CL	-L-	0.0 - 1.0	A-2-4 (0)	19	NP	15	70	10	5	100	99	85	15		6.1								
SS-1	51+00	0 ft CL	-L-	3.8 - 5.3	A-3 (0)	27	NP	18	78	1	3	99	98	81	4		8.3								
SS-2	51+00	0 ft CL	-L-	18.8 - 20.3	A-2-4 (0)	20	6	22	55	10	13	99	95	77	28										
ST-1	51+00	0 ft CL	-L-	23.8 - 25.8	A-4 (0)	22	NP	17	43	18	22	100	94	ND	46	32.2		120.1	0.217	0.176	11.11	0	6.5	8	5.2
ST-2	51+00	0 ft CL	-L-	25.5 - 27.5	A-6 (17)	40	20	3	19	34	44	100	99	ND	84			120.4							
S-3	55+00	0 ft CL	-L-	0.5 - 2.5	A-2-4 (0)	35	7	14	69	10	7	100	97	86	18		4.7								

SEE SHEET 6 FOR -L- PLANVIEW

PI = 62+00.00
EL = 75.21'
VC = 300'
K = 250

-L-

PI = 73+00.00
EL = 85.11'
VC = 1900'
K = 1583

(+)0.9000%

(-)0.3000%

C-18
61+00
CL -L-

C-19
63+00
CL -L-
S-4

PROPOSED GRADE LINE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE BLACK MODERATELY ORGANIC SILTY COARSE TO FINE SAND (SAT)

VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LAYERS (M - SAT)

C-20
65+00
CL -L-

EXISTING GROUND PROFILE

C-21
67+00
CL -L-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LAYERS (M - SAT)

C-22
69+00
CL -L-

C-23
71+00
CL -L-

C-24
73+00
CL -L-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND WITH CLAY LAYERS (M - SAT)

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOL.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	C_v (ft^2/day)	t_{50} (min)
S-4	63+00	0 ft CL	-L-	1.0 - 2.0	A-2-5 (0)	49	6	15	58	17	10	99	93	84	28		7.8				

SEE SHEET 7 FOR -L- PLANVIEW

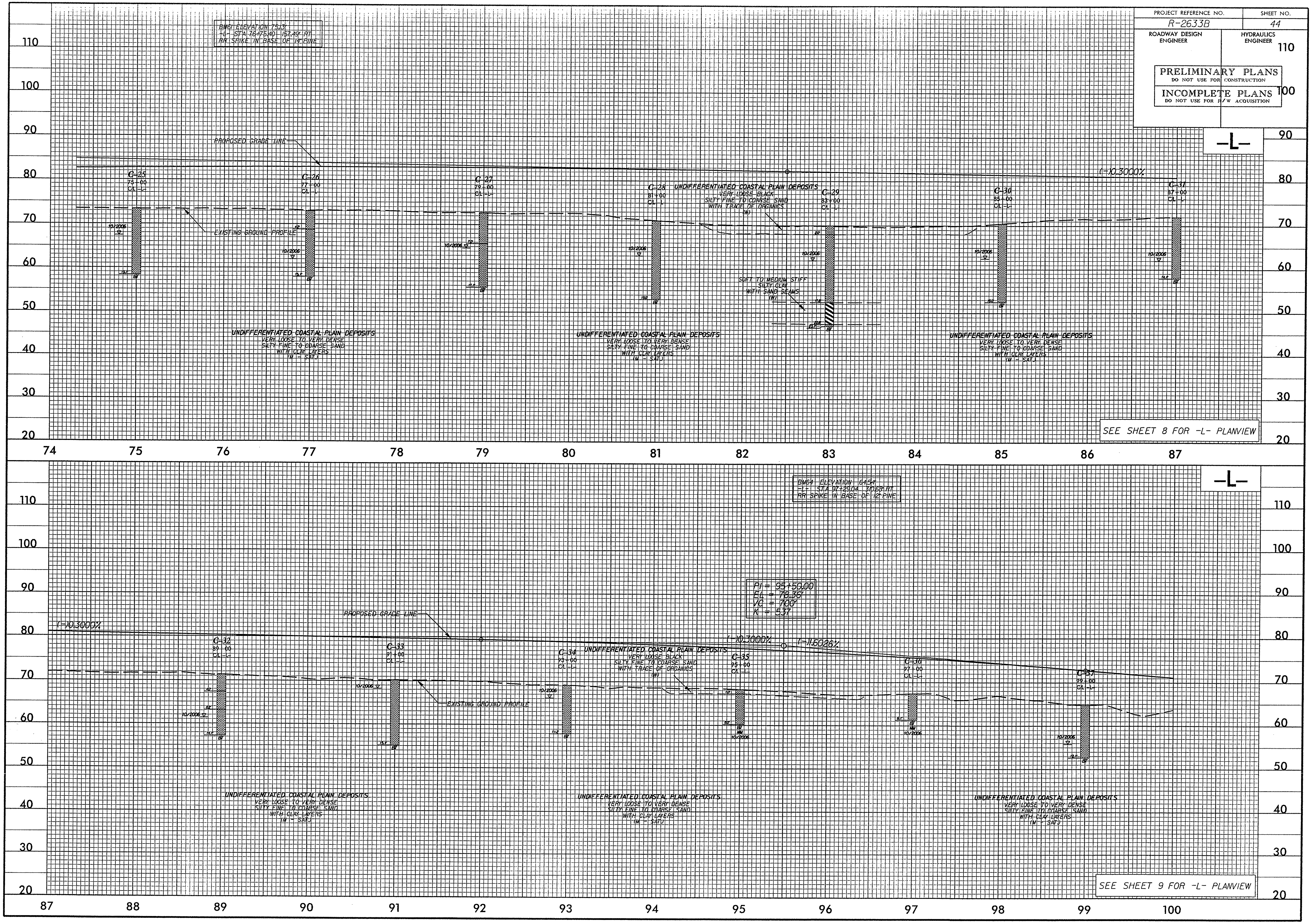
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	44

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



PROJECT REFERENCE NO.	SHEET NO.
R-2633B	45

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

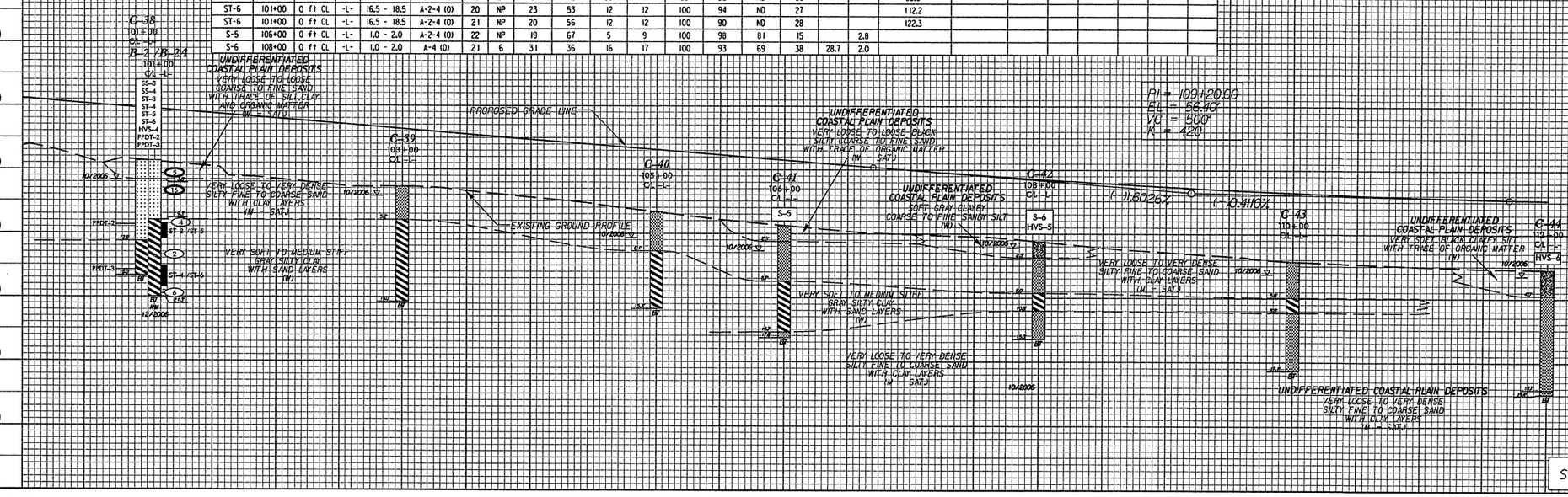
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	C_v (ft^2/day)	t_{90} (min)	Φ_s (Degrees)	c_s (psi)	Φ (Degrees)	c' (psi)
SS-3	101+00	0 ft CL	-L-	1.0 - 2.5	A-3 (0)	30	NP	20	71	3	6	100	97	80	9		2.5								
SS-4	101+00	0 ft CL	-L-	3.8 - 5.3	A-3 (0)	21	NP	5	91	3	1	100	100	95	7										
ST-3	101+00	0 ft CL	-L-	10.3 - 12.3	A-7-5 (23)	53	21	7	3	44	46	100	95	ND	91	84.9		94.7	1.03	0.088	22.6	10	2	11	3.4
ST-4	101+00	0 ft CL	-L-	17.8 - 19.8	A-2-4 (0)	21	2	20	55	13	12	100	88	ND	30										
ST-4	101+00	0 ft CL	-L-	17.8 - 19.8	A-6 (7)	31	15	4	42	34	20	100	99	ND	66	38.6		115.3	0.362	0.080	25.0	3	4.2	6	3.8
ST-5	101+00	0 ft CL	-L-	9.8 - 11.8	A-7-6 (15)	43	15	2	11	36	51	100	99	ND	88			98.4							
ST-6	101+00	0 ft CL	-L-	16.5 - 18.5	A-7-6 (17)	45	21	8	12	39	41	98	96	ND	80			95.9							
ST-6	101+00	0 ft CL	-L-	16.5 - 18.5	A-2-4 (0)	20	NP	23	53	12	12	100	94	ND	27			112.2							
ST-6	101+00	0 ft CL	-L-	16.5 - 18.5	A-2-4 (0)	21	NP	20	56	12	12	100	90	ND	28			122.3							
S-5	106+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	22	NP	19	67	5	9	100	98	81	15		2.8								
S-6	108+00	0 ft CL	-L-	1.0 - 2.0	A-4 (0)	21	6	31	36	16	17	100	93	69	38	28.7	2.0								

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-4	101+00	0 ft CL	-L-	1.0 - 1.5	752	251
HVS-5	108+00	0 ft CL	-L-	1.0 - 1.5	574	240
HVS-6	112+00	0 ft CL	-L-	1.0 - 1.5	480	125

-L-

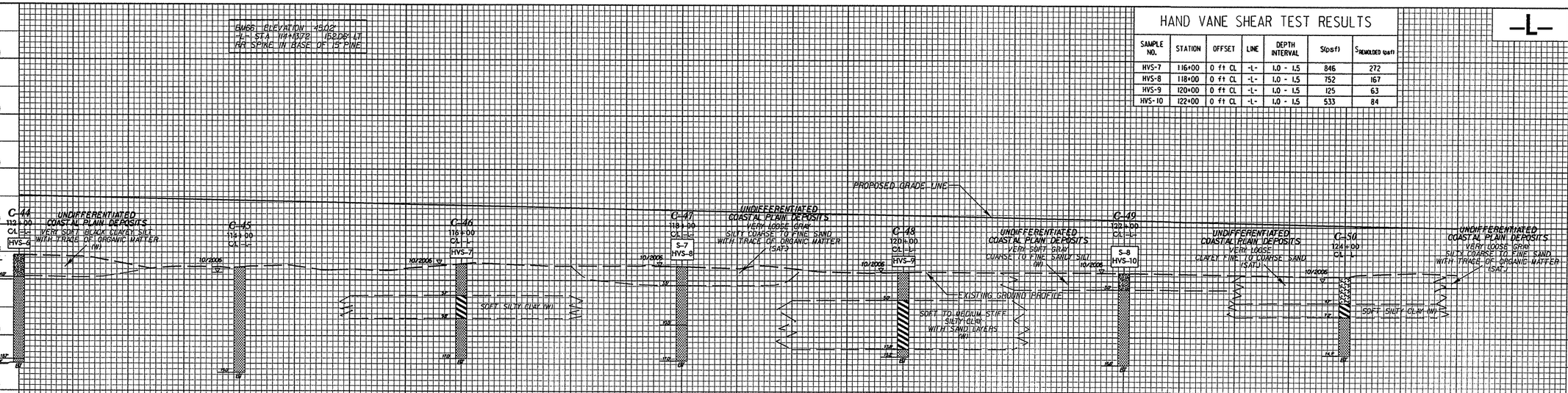


SEE SHEET 10 FOR -L- PLANVIEW

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-7	116+00	0 ft CL	-L-	1.0 - 1.5	846	272
HVS-8	118+00	0 ft CL	-L-	1.0 - 1.5	752	167
HVS-9	120+00	0 ft CL	-L-	1.0 - 1.5	125	63
HVS-10	122+00	0 ft CL	-L-	1.0 - 1.5	533	84

-L-



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	C_v (ft^2/day)	t_{90} (min)
S-7	118+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	22	5	28	43	16	13	100	90	71	34		2.9				
S-8	122+00	0 ft CL	-L-	1.0 - 2.0	A-4 (0)	21	1	16	52	20	12	100	93	84	39	32.8	2.4				

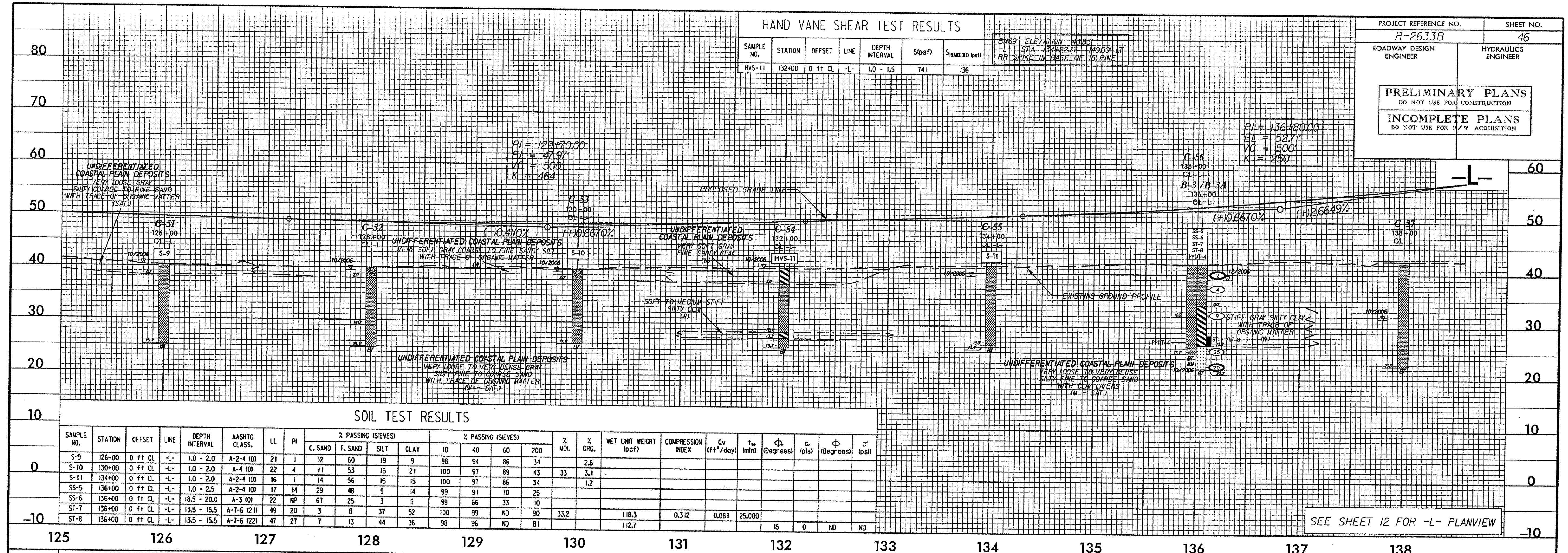
SEE SHEET 11 FOR -L- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	46

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS — DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS — DO NOT USE FOR R/W ACQUISITION

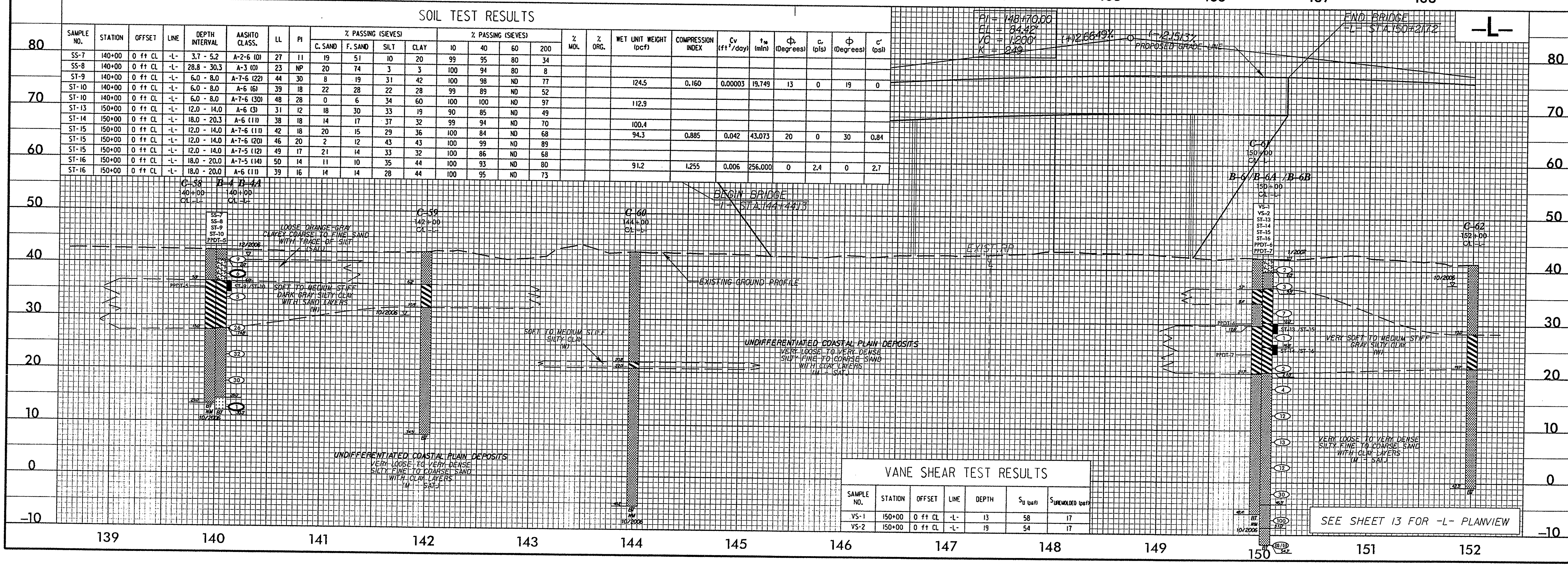


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	Cv (ft²/day)	t_{50} (min)	Φ (Degrees)	c (psi)	Φ (Degrees)	c' (psi)
S-9	126+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	21	1	12	60	19	9	98	94	86	34		2.6								
S-10	130+00	0 ft CL	-L-	1.0 - 2.0	A-4 (0)	22	4	11	53	15	21	100	97	89	43	33	3.1								
S-11	134+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	16	1	14	56	15	15	100	97	86	34		1.2								
SS-5	136+00	0 ft CL	-L-	1.0 - 2.5	A-2-4 (0)	17	14	29	48	9	14	99	91	70	25										
SS-6	136+00	0 ft CL	-L-	18.5 - 20.0	A-3 (0)	22	NP	67	25	3	5	99	66	33	10										
ST-7	136+00	0 ft CL	-L-	13.5 - 15.5	A-7-6 (21)	49	20	3	8	37	52	100	99	ND	90	33.2		118.3	0.312	0.081	25.000				
ST-8	136+00	0 ft CL	-L-	13.5 - 15.5	A-7-6 (22)	47	27	7	13	44	36	98	96	ND	81			112.7				15	0	ND	ND

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-11	132+00	0 ft CL	-L-	1.0 - 1.5	741	136



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	Cv (ft²/day)	t_{50} (min)	Φ (Degrees)	c (psi)	Φ (Degrees)	c' (psi)
SS-7	140+00	0 ft CL	-L-	3.7 - 5.2	A-2-6 (0)	27	11	19	51	10	20	99	95	80	34										
SS-8	140+00	0 ft CL	-L-	28.8 - 30.3	A-3 (0)	23	NP	20	74	3	3	100	94	80	8										
ST-9	140+00	0 ft CL	-L-	6.0 - 8.0	A-7-6 (22)	44	30	8	19	31	42	100	98	ND	77			124.5	0.160	0.00003	19.749	13	0	19	0
ST-10	140+00	0 ft CL	-L-	6.0 - 8.0	A-6 (6)	39	18	22	28	22	28	99	89	ND	52										
ST-10	140+00	0 ft CL	-L-	6.0 - 8.0	A-7-6 (30)	48	28	0	6	34	60	100	100	ND	97			112.9							
ST-13	150+00	0 ft CL	-L-	12.0 - 14.0	A-6 (3)	31	12	18	30	33	19	90	85	ND	49										
ST-14	150+00	0 ft CL	-L-	18.0 - 20.3	A-6 (11)	38	18	14	17	37	32	99	94	ND	70			100.4							
ST-15	150+00	0 ft CL	-L-	12.0 - 14.0	A-7-6 (11)	42	18	20	15	29	36	100	84	ND	68			94.3	0.885	0.042	43.073	20	0	30	0.84
ST-15	150+00	0 ft CL	-L-	12.0 - 14.0	A-7-6 (20)	46	20	2	12	43	43	100	99	ND	89										
ST-15	150+00	0 ft CL	-L-	12.0 - 14.0	A-7-5 (12)	49	17	21	14	33	32	100	86	ND	68										
ST-16	150+00	0 ft CL	-L-	18.0 - 20.0	A-7-5 (14)	50	14	11	10	35	44	100	93	ND	80			91.2	1.255	0.006	256.000	0	2.4	0	2.7
ST-16	150+00	0 ft CL	-L-	18.0 - 20.0	A-6 (11)	39	16	14	14	28	44	100	95	ND	73										

VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH	S_U (psf)	$S_{UREMOLDED}$ (psf)
VS-1	150+00	0 ft CL	-L-	13	58	17
VS-2	150+00	0 ft CL	-L-	19	54	17

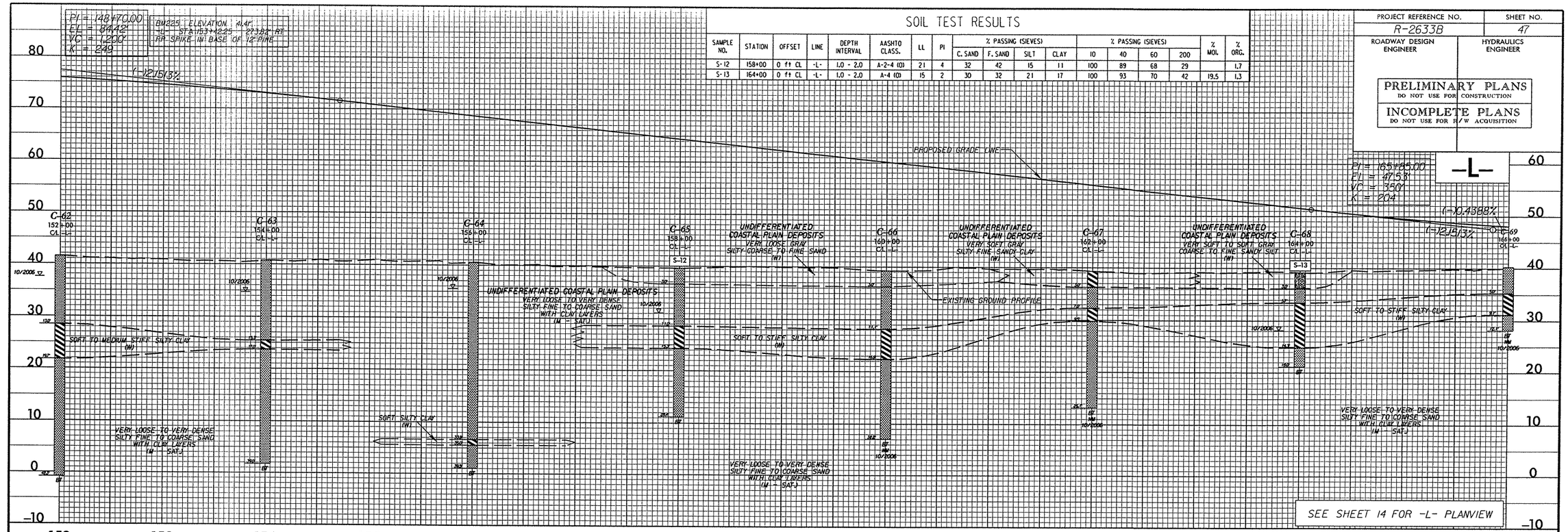
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

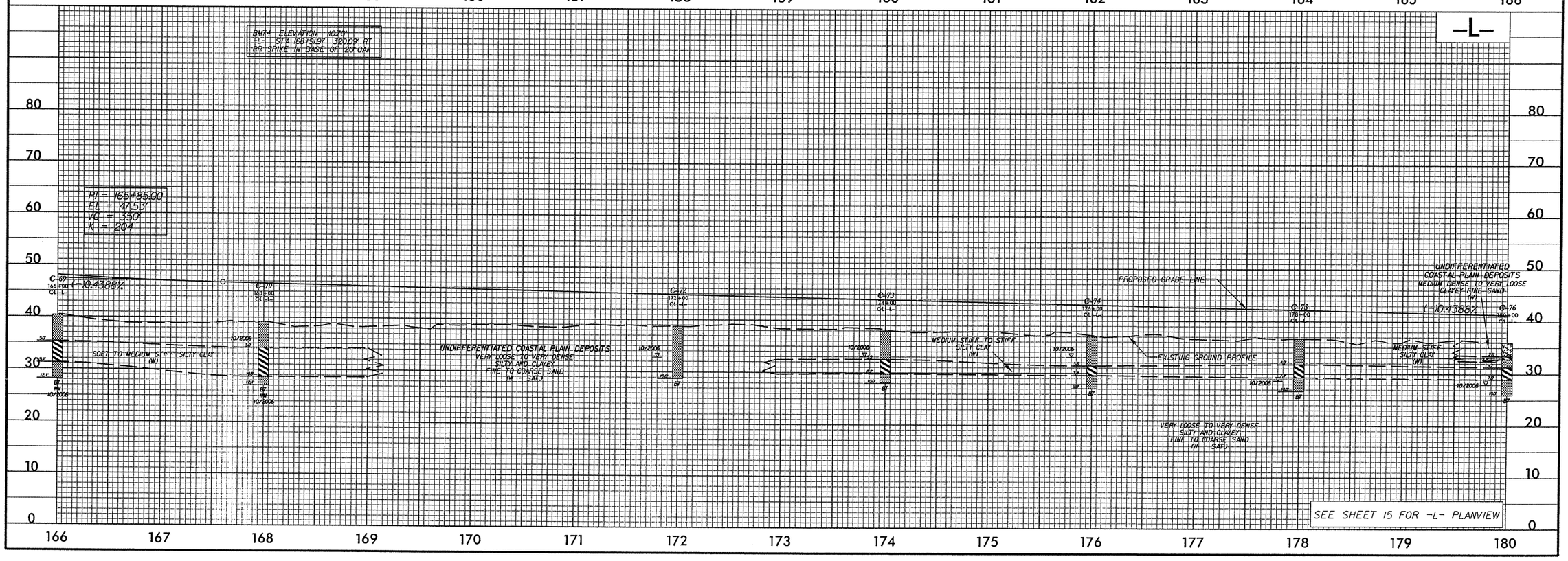
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-12	158+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	21	4	32	42	15	11	100	89	68	29		1.7
S-13	164+00	0 ft CL	-L-	1.0 - 2.0	A-4 (0)	15	2	30	32	21	17	100	93	70	42	19.5	1.3

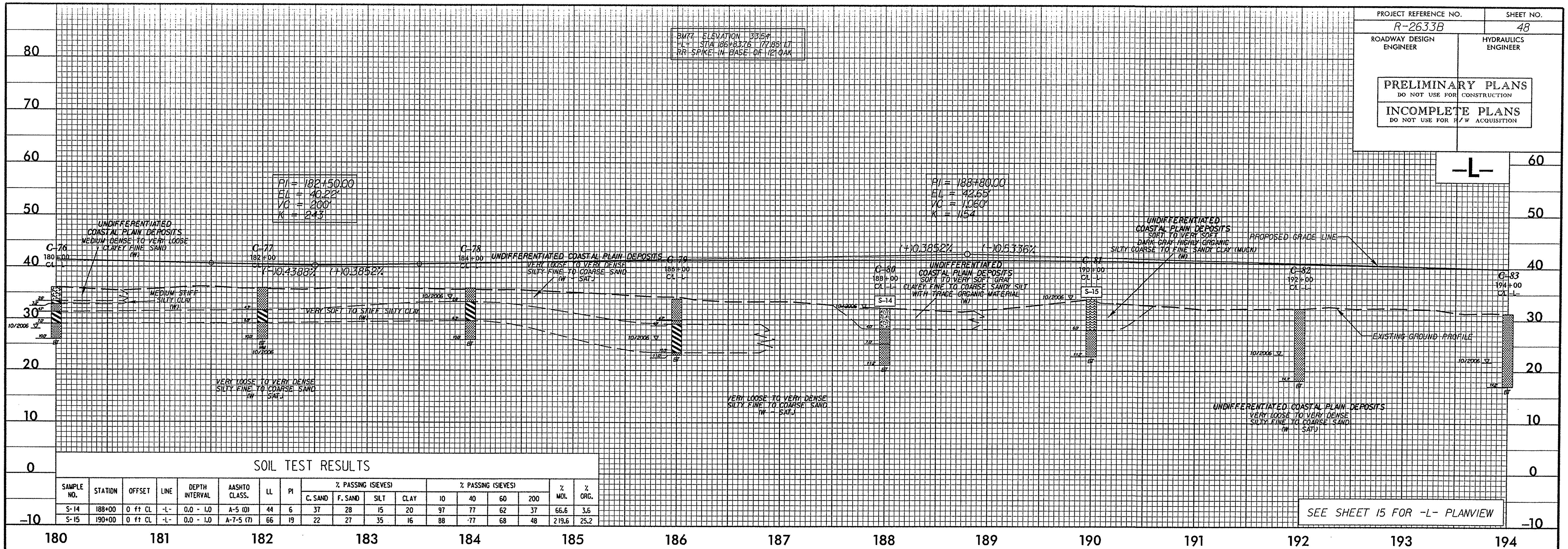




PROJECT REFERENCE NO.	SHEET NO.
R-2633B	48
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

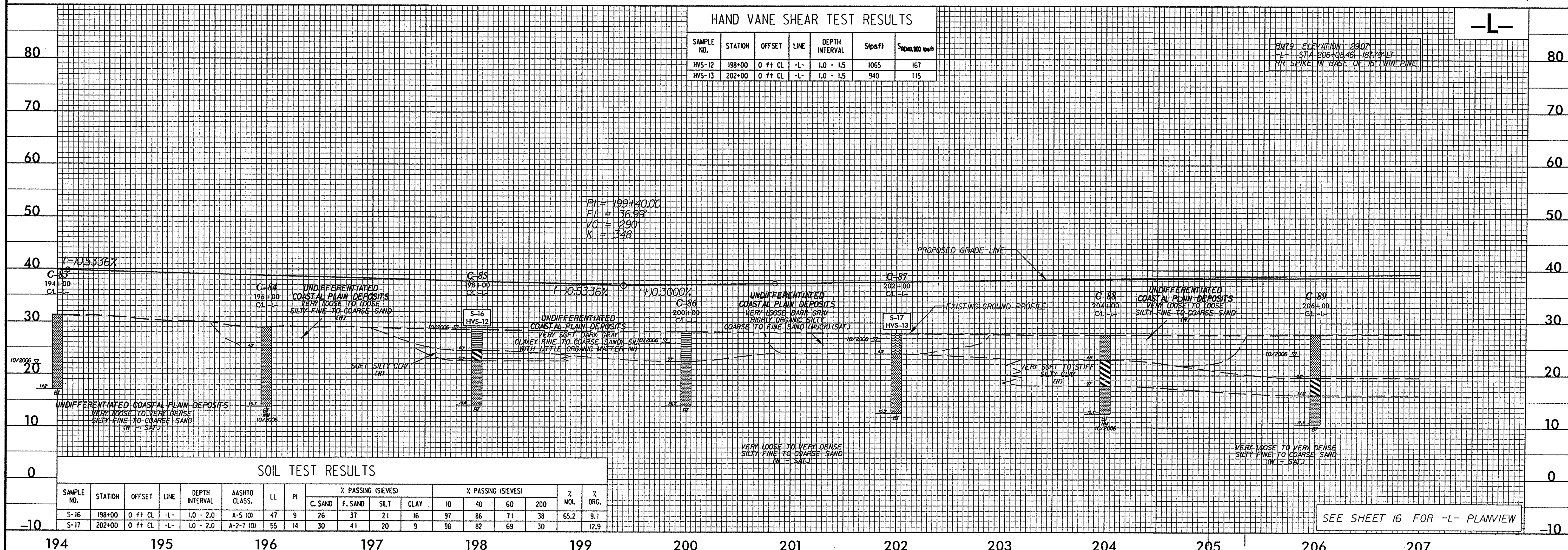


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-14	188+00	0 ft CL	-L-	0.0 - 1.0	A-5 (0)	44	6	37	28	15	20	97	77	62	37	66.6	3.6
S-15	190+00	0 ft CL	-L-	0.0 - 1.0	A-7-5 (7)	66	19	22	27	35	16	88	·77	68	48	219.6	25.2

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-12	198+00	0 ft CL	-L-	1.0 - 1.5	1065	167
HVS-13	202+00	0 ft CL	-L-	1.0 - 1.5	940	115



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-16	198+00	0 ft CL	-L-	1.0 - 2.0	A-5 (0)	47	9	26	37	21	16	97	86	71	38	65.2	9.1
S-17	202+00	0 ft CL	-L-	1.0 - 2.0	A-2-7 (0)	55	14	30	41	20	9	98	82	69	30		12.9

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-14	214+00	0 ft CL	-L-	1.0 - 1.5	888	104
HVS-15	216+00	0 ft CL	-L-	1.0 - 1.5	334	178
HVS-16	218+00	0 ft CL	-L-	1.0 - 1.5	919	209

PI = 210+60.00
EL = 40.95'
VC = 1,050'
K = 3249

(+)0.3000% (−)0.3002%

C-90 208+00 CL -L-
C-91 210+00 CL -L-
C-92 212+00 CL -L-
C-93 214+00 CL -L-
C-94 216+00 CL -L-
C-95 218+00 CL -L-
C-96 220+00 CL -L-

S-18 10/2006
S-19 HVS-14 10/2006
S-20 HVS-15 10/2006
HVS-16 10/2006

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

SOFT TO MEDIUM STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO LOOSE BLACK MODERATELY ORGANIC SILTY CLAYEY COARSE TO FINE SAND (SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO LOOSE SILTY FINE TO COARSE SAND (W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND (W - SAT.)

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.
S-18	210+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	21	NP	48	38	4	10	99	75	52	15		1.9
S-19	214+00	0 ft CL	-L-	1.0 - 2.0	A-2-4 (0)	34	NP	26	46	11	17	99	89	73	30		5.1
S-20	216+00	0 ft CL	-L-	1.0 - 1.5	A-2-4 (0)	33	NP	25	42	14	19	100	90	75	35		7.6

SEE SHEET 17 FOR -L- PLANVIEW

207 208 209 210 211 212 213 214 215 216 217 218 219 220 221

70 60 50 40 30 20 10 0 −10 −20

-L-

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-17	222+00	0 ft CL	-L-	1.0 - 1.5	564	303
HVS-18	228+00	0 ft CL	-L-	1.0 - 1.5	679	251
HVS-19	232+00	0 ft CL	-L-	1.0 - 1.5	950	230

BUBL ELEVATION 27.24'
-L- STA 229+50.92 | 61.99' LT
RR SPIKE IN BASE OF 16" PINE

PI = 227+30.00
EL = 35.04'
VC = 360'
K = 600

C-97 222+00 CL -L-
C-98 224+00 CL -L-
C-99 226+00 CL -L-
C-100 228+00 CL -L-
C-102 232+00 CL -L-
C-103 234+00 CL -L-

S-21 HVS-17 10/2006
S-22 HVS-18 10/2006
HVS-19 10/2006

(+)0.3002% (−)0.3000%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

SOFT TO MEDIUM STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO LOOSE SILTY FINE TO COARSE SAND (W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE BLACK MODERATELY ORGANIC SILTY CLAYEY COARSE TO FINE SAND (SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND (W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO LOOSE BLACK MODERATELY ORGANIC CLAYEY COARSE TO FINE SAND (SAT.)

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.
S-21	222+00	0 ft CL	-L-	1.0 - 1.5	A-2-4 (0)	19	NP	30	53	8	9	100	91	70	18		5.1
S-22	228+00	0 ft CL	-L-	1.0 - 1.5	A-2-4 (0)	17	NP	33	47	7	13	100	88	67	21		5.2

SEE SHEET 18 FOR -L- PLANVIEW

221 222 223 224 225 226 227 228 229 230 231 232 233 234

70 60 50 40 30 20 10 0 −10 −20

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

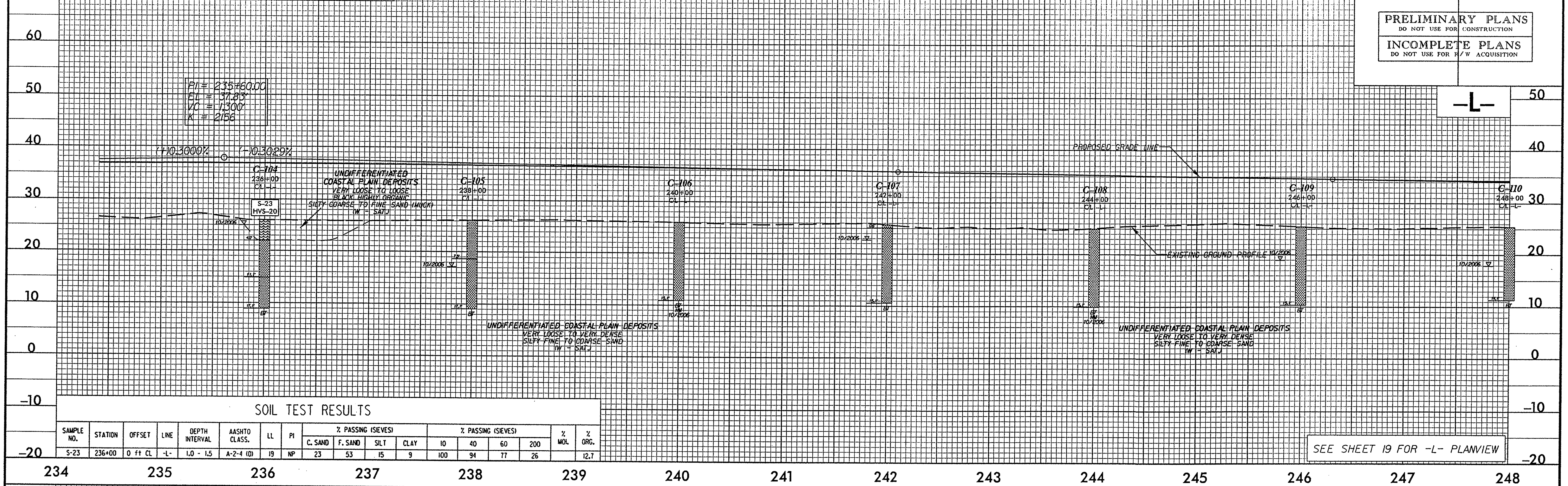
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(pcf)	S(remolded)(pcf)
HVS-20	236+00	0 ft CL	-L-	1.0 - 1.5	815	313

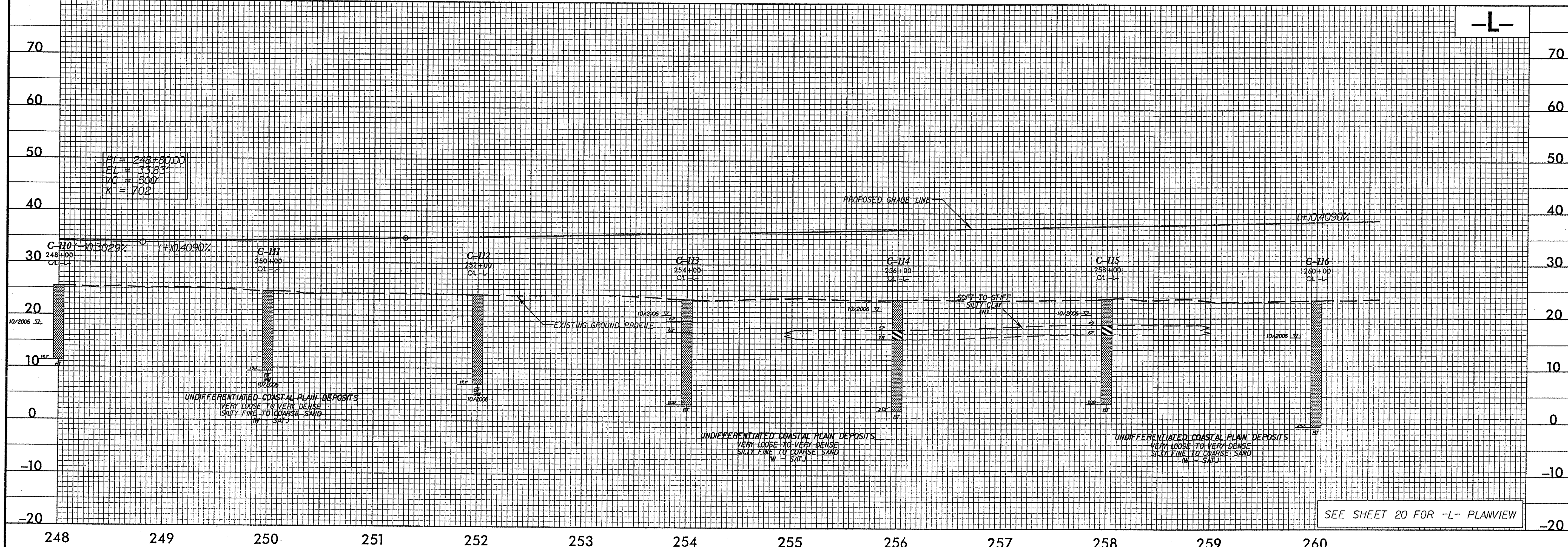
BM83 ELEVATION 27.24'
-L- STA 243+47.72 172.58' LT
RR SPIKE IN BASE OF 8" PINE



-L-
PI = 235+60.00
EL = 37.83'
VC = 1300'
K = 2156
(+)0.3000%
(-)0.3029%
C-104
236+00
CL -L-
S-23
HVS-20
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO LOOSE
BLACK HIGHLY ORGANIC
SILTY COARSE TO FINE SAND (MUCK)
(W - SAT.)
C-105
238+00
C-106
240+00
C-107
242+00
C-108
244+00
C-109
246+00
C-110
248+00
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
SEE SHEET 19 FOR -L- PLANVIEW
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOI.	% ORG.
S-23	236+00	0 ft CL	-L-	1.0 - 1.5	A-2-4 (0)	19	NP	23	53	15	9	100	94	77	26		12.7



-L-
PI = 248+80.00
EL = 33.83'
VC = 500'
K = 702
(-)0.3029%
(+)0.4090%
C-110
248+00
C-111
250+00
C-112
252+00
C-113
254+00
C-114
256+00
C-115
258+00
C-116
260+00
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
SOFT TO STIFF
SILTY CLAY
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
SEE SHEET 20 FOR -L- PLANVIEW
248
249
250
251
252
253
254
255
256
257
258
259
260

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	51

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

BM65 ELEVATION 24.94'
-L- STA 263+61.29 137.64' RT
RR SPIKE IN BASE OF 15" PINE

BEGIN BRIDGE
-L- STA 263+89.28

END BRIDGE
-L- STA 267+12.50

PROPOSED GRADE LINE

(-)0.40000%

(+)0.40090%

EXISTING GROUND PROFILE

C-117
262+00
CL -L-

C-118
264+00
CL -L-

C-119
267+00
CL -L-

C-120
269+00
CL -L-

STIFF SILTY CLAY (M)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(M - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
MEDIUM STIFF TO VERY STIFF
SILTY CLAY
(M)

10/2006

BF

SEE SHEET 21 FOR -L- PLANVIEW

-L-

PI = 275+40.00
EL = 44.71'
VC = 250'
K = 480

BEGIN BRIDGE
-L- STA 280+69.69

PI = 281+50.00
EL = 60.58'
VC = 430'
K = 250

END BRIDGE
-L- STA 282+14.61

PROPOSED GRADE LINE

(+)0.40090%

(+)0.93000%

(+)0.95000%

(-)1.55000%

Y9 CEDAR HILL RD.

FUTURE LOOP

EXISTING GROUND PROFILE

C-121
271+00
CL -L-

C-122
273+00
CL -L-

C-123
275+00
CL -L-

C-124
277+00
CL -L-

C-125
279+00
CL -L-

C-126
280+98
100 Rt. -L-

C-127
282+50
CL -L-

MEDIUM STIFF TO STIFF SILTY CLAY (M)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(M - SAT.)

MEDIUM STIFF TO HARD FINE SANDY SILTY CLAY (M)

10/2006

BF

SEE SHEET 22 FOR -L- PLANVIEW

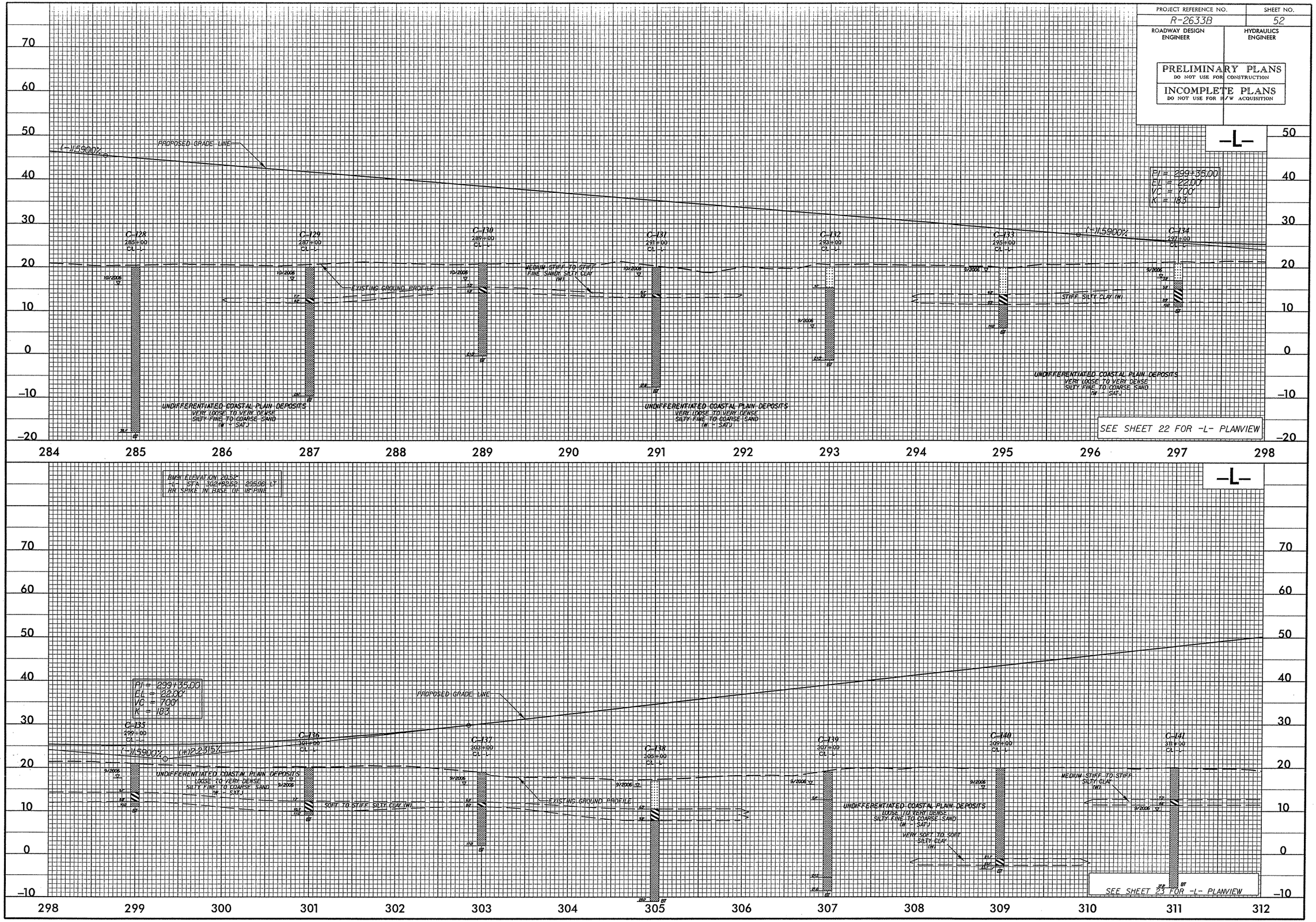
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	52

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



PROJECT REFERENCE NO.	SHEET NO.
R-2633B	53

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

~~PRELIMINARY PLANS~~
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

BEGIN BRIDGE
-L- STA. 317+41.31

PROPOSED GRADE LINE

(+)2.2315%

PI = 326+85.00
EL = 83.37'
VC = 1.270'
K = 247

(+)2.2315%

(-)12.9036%

MAINTAIN OLD ROADBED FOR BRIDGE CONSTRUCTION, PER NCDOT.

C-142
313+00
CL -L-

C-143
315+00
CL -L-

C-144
317+00
CL -L-

9/2006

EXISTING GROUND PROFILE

STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

HARD SILTY CLAY (W)

SEE SHEET 24 FOR -L- PLANVIEW

312 313 314 315 316 317 318 319 320 321 322 323 324 325 326

70 60 50 40 30 20 10 0 -10

-L-

(+)2.2315%

(-)12.9036%

BM94 ELEVATION 357'
-L- STA 330+29.24 11.80 RT.
RR SPIKE IN BASE OF 12 CYPRESS

PROPOSED GRADE LINE

PI = 326+85.00
EL = 83.37'
VC = 1.270'
K = 247

PI = 339+60.00
EL = 76.35'
VC = 500'
K = 192

(-)12.9036%

BM93 ELEVATION 356'
-L- STA 327+76.81 49.49 RT.
RR SPIKE IN BASE OF 16 CYPRESS

EXISTING GROUND PROFILE

SEE SHEET 25 -L- PLANVIEW

326 327 328 329 330 331 332 333 334 335 336 337 338 339

60 50 40 30 20 10 0 -10

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	54

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

PI = 339+60.00
EL = 46.35'
VC = 500'
K = 192

PROPOSED GRADE LINE

(-)2.9036%

(-)0.3000%

(-)0.3000%

EXISTING GROUND PROFILE

SEE SHEET 26 FOR -L- PLANVIEW

60 50 40 30 20 10 0 -10

340 341 342 343 344 345 346 347 348 349 350 351 352 353

-L-

PROPOSED GRADE LINE

(-)0.3000%

(-)0.3000%

EXISTING GROUND PROFILE

SEE SHEET 27 FOR -L- PLANVIEW

60 50 40 30 20 10 0 -10

353 354 355 356 357 358 359 360 361 362 363 364 365 366 367

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

PROPOSED GRADE LINE

(-)0.3000%

(-)0.3000%

EXISTING GROUND PROFILE

SEE SHEET 28 FOR -L- PLANVIEW

60 50 40 30 20 10 0 -10

367 368 369 370 371 372 373 374 375 376 377 378 379 380

BM96 ELEVATION 755'
-L- STA 388+45.43 200DK RT
RR SPIKE IN BASE OF 24"TWIN OAK

END BRIDGE
-L- STA 389+24.54

PI = 391+80.00
EL = 3059'
VC = 550'
K = 183

-L-

PROPOSED GRADE LINE

(-)0.3000%

(-)0.3000%

(+)2.7042%

EXISTING GROUND PROFILE

C-145
389+50
CL -L-

C-146
391+00
CL -L-

C-147
393+00
CL -L-

9/2006

MEDIUM STIFF TO STIFF SILTY CLAY (M)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

SEE SHEET 29 FOR -L- PLANVIEW

40 30 20 10 0 -10 -20 -30 -40 -50

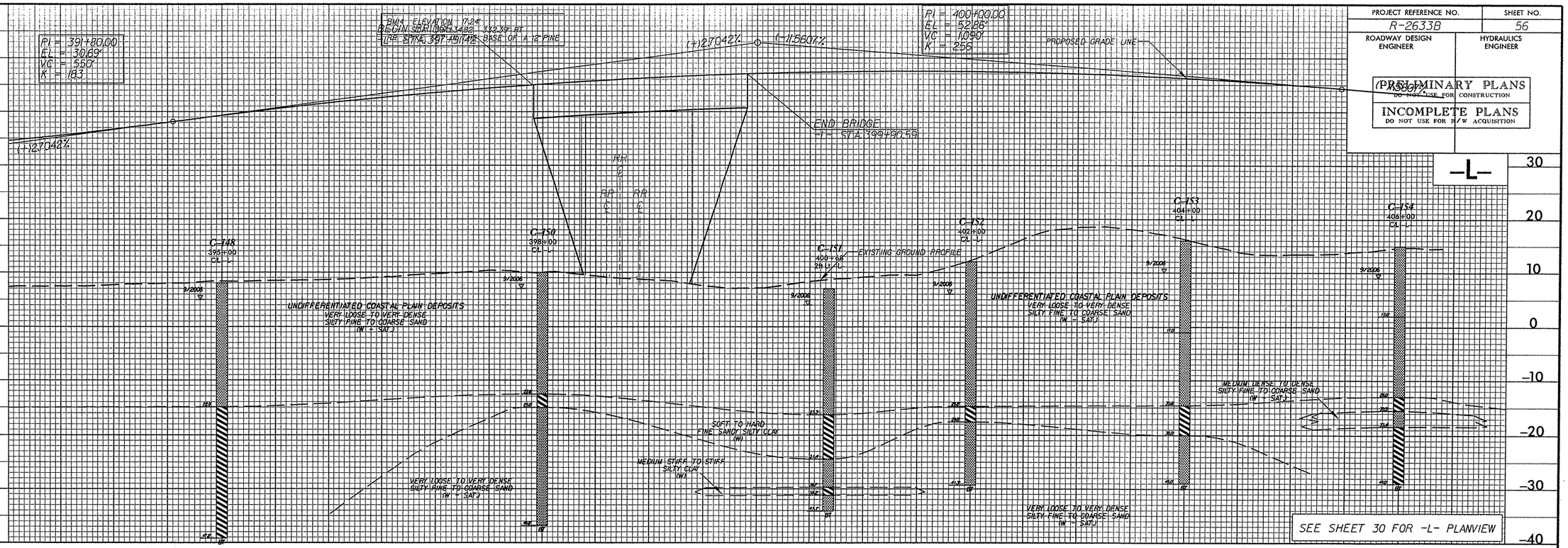
380 381 382 383 384 385 386 387 388 389 390 391 392 393

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

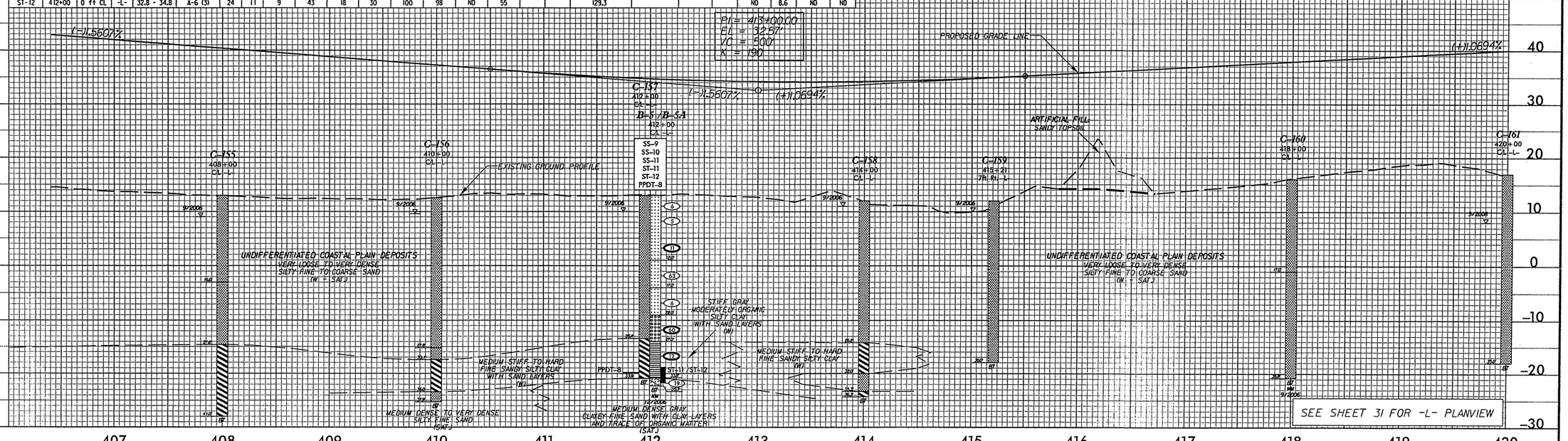
-L-

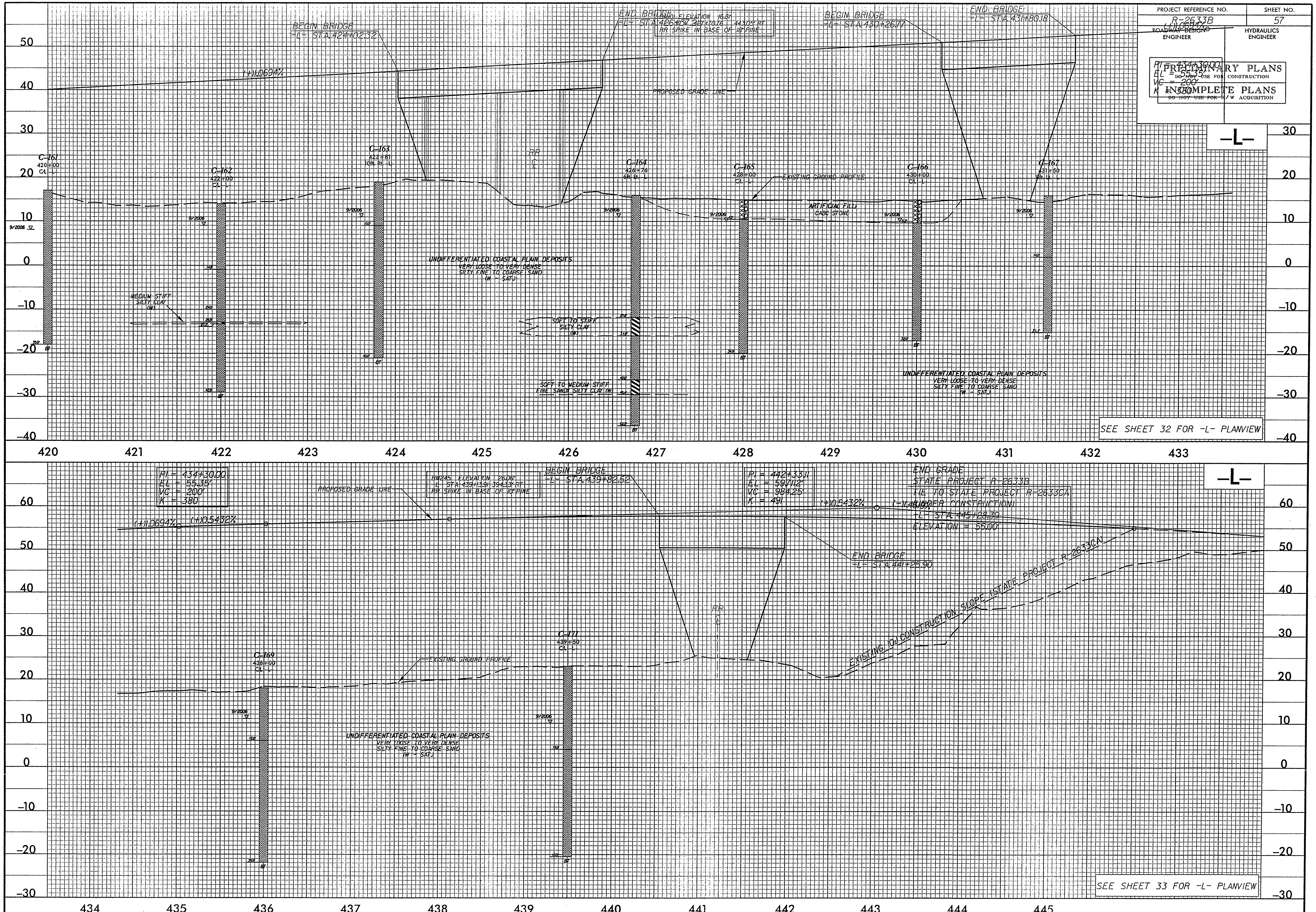


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES) C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	60	200	% MOL.	% ORG.	WET UNIT WEIGHT (pcf)	COMPRESSION INDEX	C_v (ft^2/day)	t_{90} (min)	Φ (Degrees)	c_u (psi)	Φ (Degrees)	c' (psi)
SS-9	412+00	0 ft CL	-L-	8.8 - 10.3	A-3 (0)	17	NP	83	15	1	1	100	60	17	2										
SS-10	412+00	0 ft CL	-L-	23.8 - 25.3	A-1-b (0)	14	NP	88	10	1	1	96	38	12	2										
SS-11	412+00	0 ft CL	-L-	28.8 - 30.3		77	34									136.5	15.2								
ST-11	412+00	0 ft CL	-L-	31.8 - 33.8	A-2-4 (0)	15	NP	21	54	13	12	100	95	ND	31			129.3	0.070	1.97	1.0				
ST-12	412+00	0 ft CL	-L-	32.8 - 34.8	A-4 (0)	18	3	15	50	15	20	100	96	ND	40										
ST-12	412+00	0 ft CL	-L-	32.8 - 34.8	A-6 (3)	24	11	9	43	18	30	100	98	ND	55			129.3				ND	8.6	ND	ND

-L-





PROJECT REFERENCE NO.
R-2633B
SHEET NO.
57
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-L-
BEGIN BRIDGE
-L- STA.424+02.32
END BRIDGE
-L- STA.426+
BEGIN BRIDGE
-L- STA.430+26.77
END BRIDGE
-L- STA.431+80.18
(+)1.0694%
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
C-161
420+00
C-162
422+00
C-163
423+81
C-164
426+76
C-165
428+00
C-166
430+00
C-167
431+50
ARTIFICIAL FILL
CABC STONE
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)
MEDIUM STIFF
SILTY CLAY
(W)
SOFT TO STIFF
SILTY CLAY
(W)
SOFT TO MEDIUM STIFF
FINE SANDY SILTY CLAY (W)
SEE SHEET 32 FOR -L- PLANVIEW
420 421 422 423 424 425 426 427 428 429 430 431 432 433
PI = 434+30.00
EL = 55.35'
VC = 200'
K = 380
BM245 ELEVATION 26.06'
PROPOSED GRADE LINE
BEGIN BRIDGE
-L- STA.439+82.52
PI = 442+33.11
EL = 59.7112'
VC = 984.25'
K = 491
(+)0.5432%
(+)1.0694%
END GRADE
STATE PROJECT R-2633B
TIE TO STATE PROJECT R-2633CA
(UNDER CONSTRUCTION)
-L- STA.445+28.39
ELEVATION = 55.00'
END BRIDGE
-L- STA.441+25.90
EXISTING (O) CONSTRUCTION SLOPE (STATE PROJECT R-2633CA)
EXISTING GROUND PROFILE
C-169
436+00
C-171
439+50
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)
SEE SHEET 33 FOR -L- PLANVIEW
434 435 436 437 438 439 440 441 442 443 444 445

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM27 ELEVATION 68.12'
-Y5- STA 13+59.64 232.95' RT
RR SPIKE IN BASE OF 12" PINE

BEGIN GRADE
-Y5- STA 10+50.00
EL.= 68.00'

PI = 11+40.00
EL = 68.36'
VC = 180'
K = 259

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

(+)0.3900%

(-)0.3041%

PI = 15+30.00
EL = 67.17'
VC = 500'
K = 828

(-)0.3041%

(+)0.3000%

PI = 20+50.00
EL = 68.72'
VC = 150'
K = 250

(+)0.3000%

(-)0.3000%

PI = 23+25.00
EL = 67.90'
VC = 400'
K = 633

(-)0.3000%

(+)0.3319%

-Y5-

SEE SHEETS 6 & 34 FOR -Y5- PLANVIEW

BM22 ELEVATION 68.80
-Y5- STA 35+64.32 14.07' RT
RR SPIKE IN BASE OF 18" PINE

PI = 23+25.00
EL = 67.90'
VC = 400'
K = 633

(+)0.3319%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

PI = 27+95.00
EL = 69.46'
VC = 420'
K = 665

(+)0.3319%

(-)0.3000%

PI = 31+55.00
EL = 68.38'
VC = 300'
K = 495

(-)0.3000%

(+)0.3067%

PI = 33+80.00
EL = 69.07'
VC = 150'
K = 225

(+)0.3067%

(-)0.3608%

(-)0.3608%

PI = 36+35.00
EL = 68.15'
VC = 360'
K = 545

(-)0.3608%

(+)0.3000%

-Y5-

SEE SHEETS 6 & 35 FOR -Y5- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	59

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

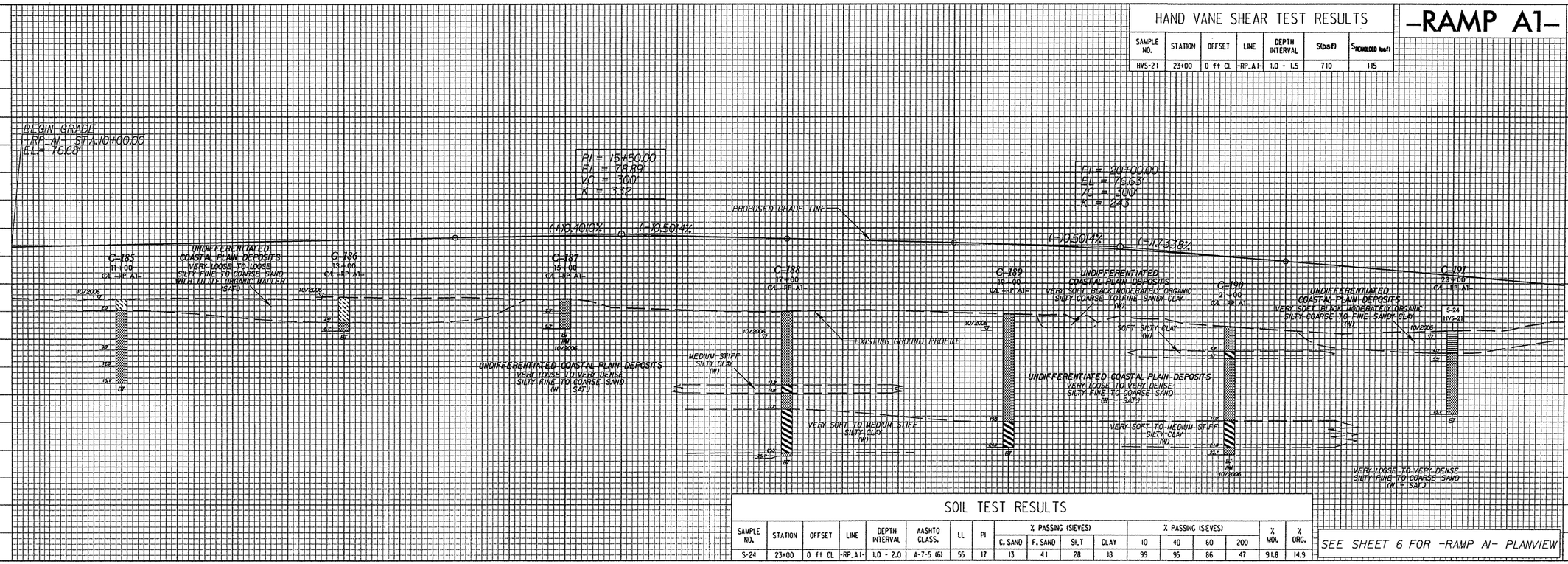
-Y5-

SEE SHEET 35 FOR -Y5- PLANVIEW

-RAMP A1-

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-21	23+00	0 ft CL	-RP_A1-	1.0 - 1.5	710	115



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-24	23+00	0 ft CL	-RP_A1-	1.0 - 2.0	A-7-5 (6)	55	17	13	41	28	18	99	95	86	47	91.8	14.9

SEE SHEET 6 FOR -RAMP A1- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	60

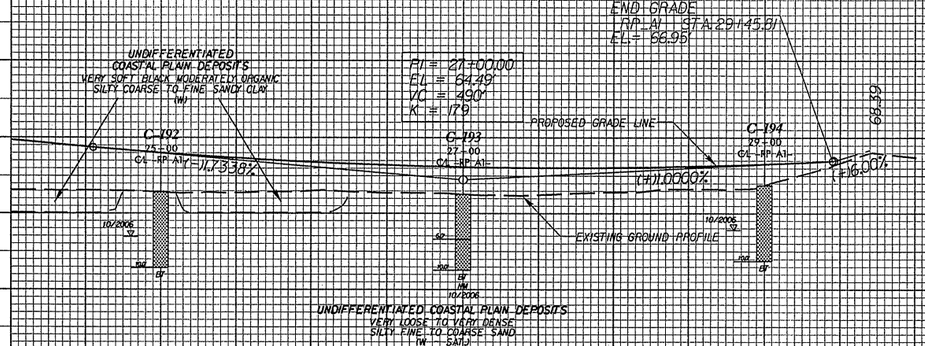
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

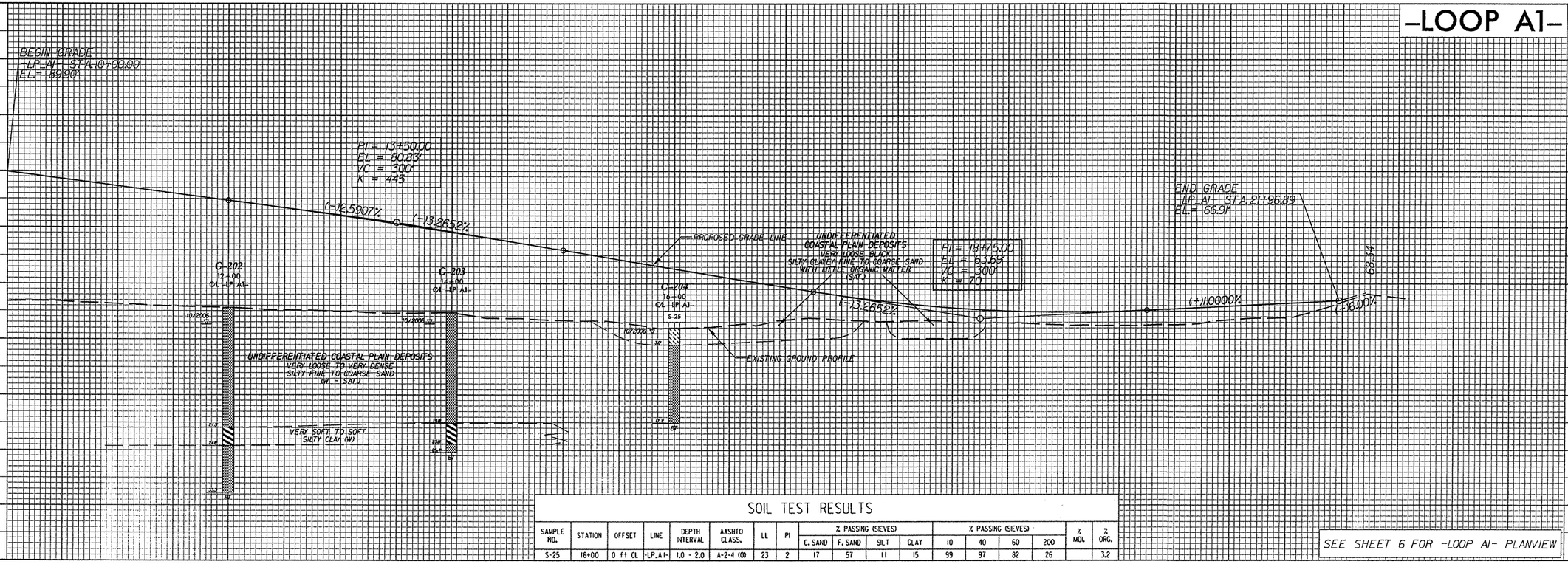
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP A1-



SEE SHEET 6 FOR -RAMP A1- PLANVIEW

-LOOP A1-



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-25	16+00	0 ft CL	-LP_A1-	1.0 - 2.0	A-2-4 (0)	23	2	17	57	11	15	99	97	82	26		3.2

SEE SHEET 6 FOR -LOOP A1- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	61

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

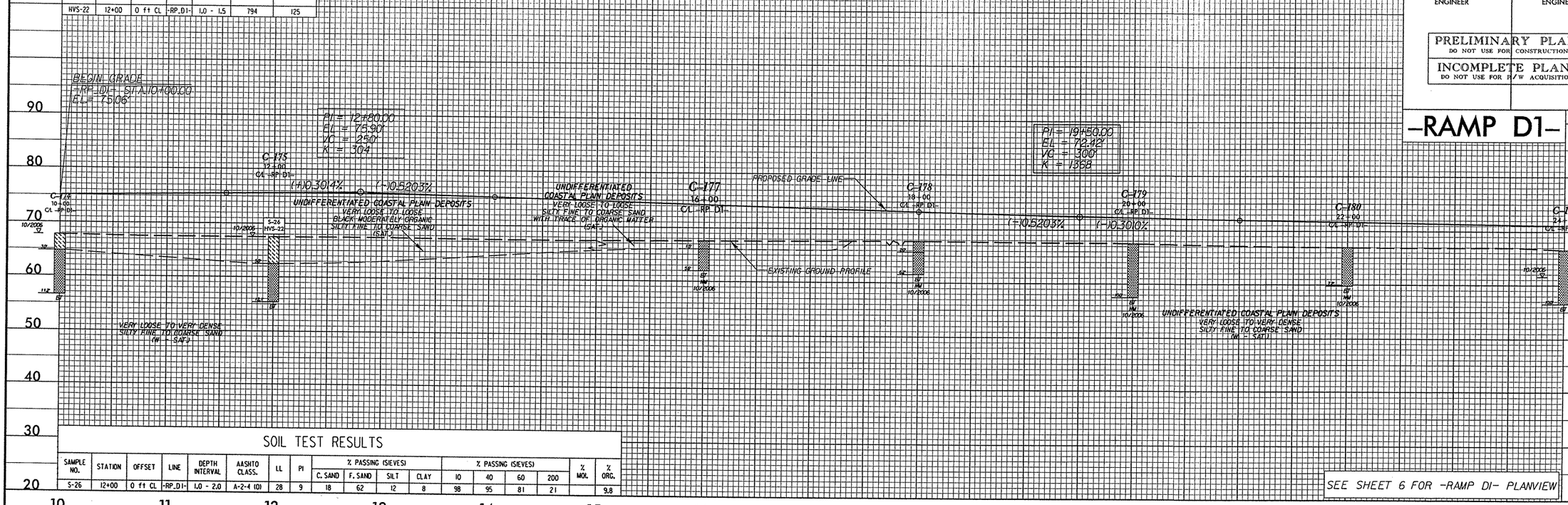
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP D1-

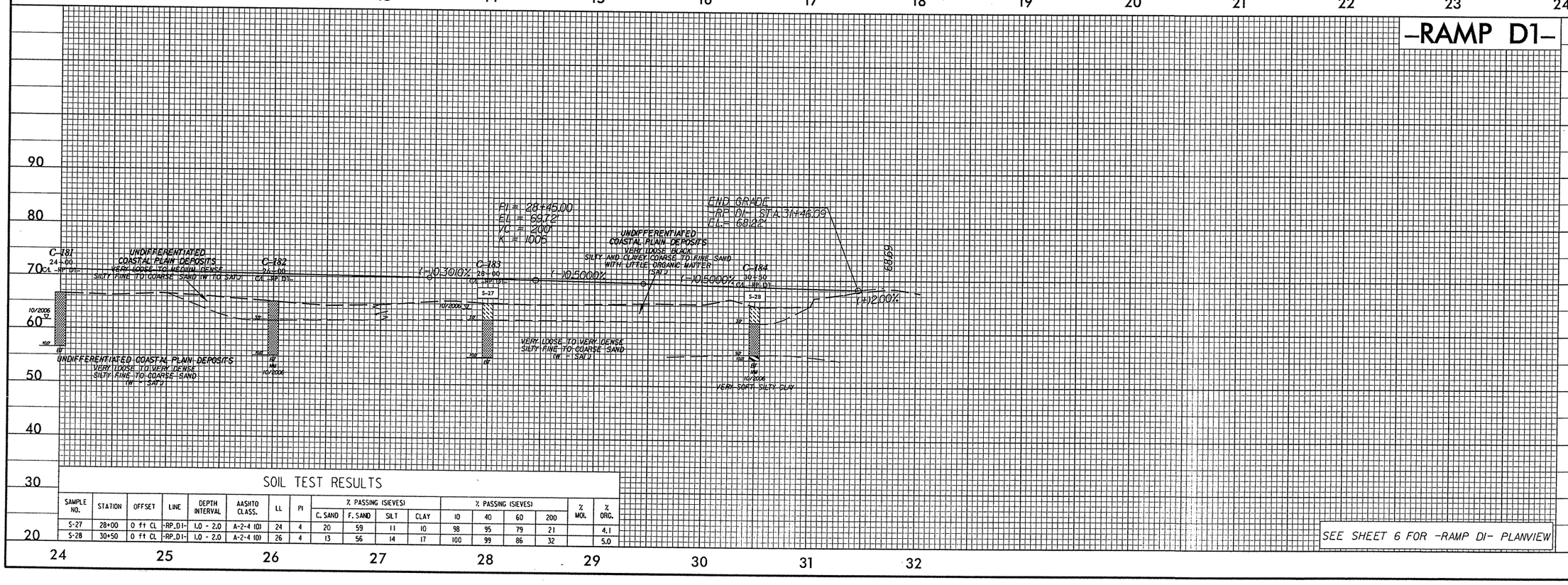
HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	$S_{(psf)}$	$S_{REMOLDED\ (psf)}$
HVS-22	12+00	0 ft CL	-RP_D1-	1.0 - 1.5	794	125



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-26	12+00	0 ft CL	-RP_D1-	1.0 - 2.0	A-2-4 (0)	28	9	18	62	12	8	98	95	81	21		9.8



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-27	28+00	0 ft CL	-RP_D1-	1.0 - 2.0	A-2-4 (0)	24	4	20	59	11	10	98	95	79	21		4.1
S-28	30+50	0 ft CL	-RP_D1-	1.0 - 2.0	A-2-4 (0)	26	4	13	56	14	17	100	99	86	32		5.0

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	62

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

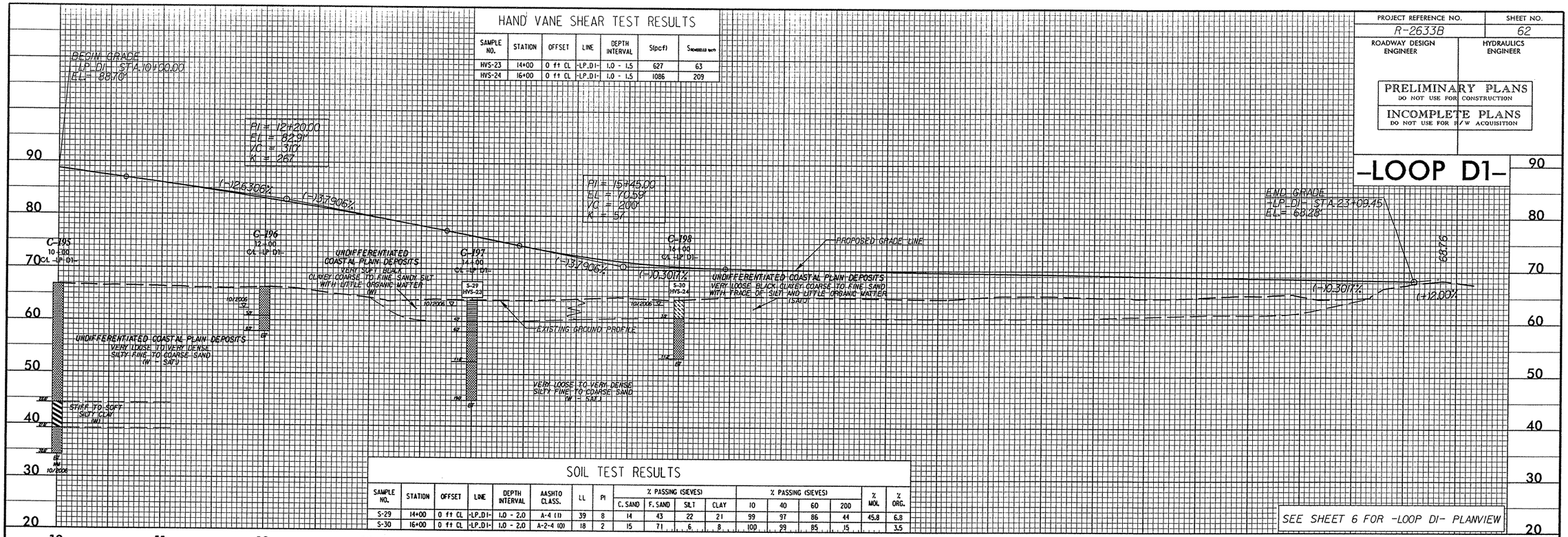
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-LOOP D1-

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(pcf)	Sremolded (pcf)
HVS-23	14+00	0 ft CL	-LP_D1-	1.0 - 1.5	627	63
HVS-24	16+00	0 ft CL	-LP_D1-	1.0 - 1.5	1086	209

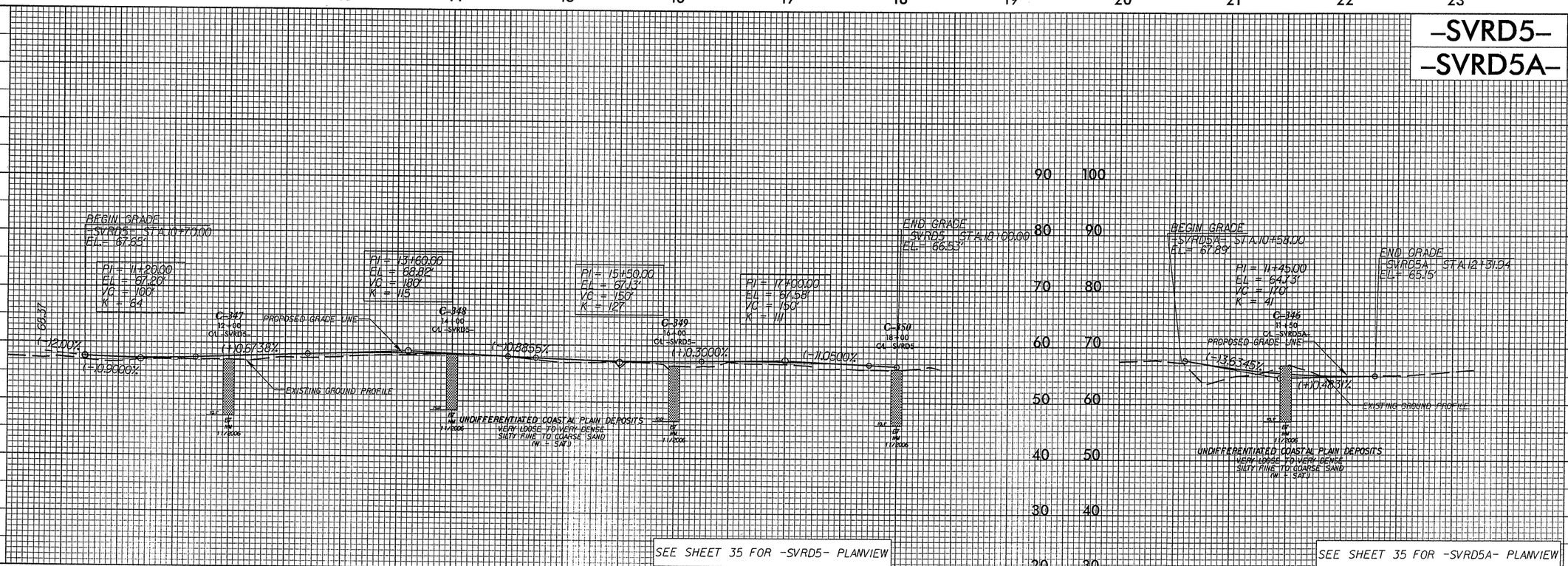


SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-29	14+00	0 ft CL	-LP_D1-	1.0 - 2.0	A-4 (1)	39	8	14	43	22	21	99	97	86	44	45.8	6.8
S-30	16+00	0 ft CL	-LP_D1-	1.0 - 2.0	A-2-4 (0)	18	2	15	71	6	8	100	99	85	15		3.5

SEE SHEET 6 FOR -LOOP D1- PLANVIEW

-SVRD5-
-SVRD5A-



SEE SHEET 35 FOR -SVRD5- PLANVIEW

SEE SHEET 35 FOR -SVRD5A- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	63

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y7-

BEGIN GRADE
-Y7- STA 15+00.00
EL = 35.00'

(+)0.3000%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

C-235
22+00
CL -Y7-

PI = 23+90.00
EL = 37.67'
VC = 512'
K = 118

(+)0.3000%

(-)4.6241%

C-236
23+00
CL -Y7-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

C-237
26+00
CL -Y7-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE SILTY CLAYEY FINE TO COARSE SAND
(W)

C-238
28+00
CL -Y7-

PI = 30+20.00
EL = 66.80'
VC = 630'
K = 146

(+)4.6241%

SEE SHEETS 15 & 36 FOR -Y7- PLANVIEW

-Y7-

BEGIN BRIDGE
-Y7- STA 30+63.18

PI = 30+20.00
EL = 66.80'
VC = 630'
K = 146

(+)4.6241%

(+)0.3000%

END BRIDGE
-Y7- STA 32+74.72

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE SILTY CLAYEY FINE TO COARSE SAND
(W)

C-239
30+63
CL -Y7-

C-240
32+75
CL -Y7-

SOFT TO MEDIUM STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

C-242
36+00
CL -Y7-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE CLAYEY FINE SAND
(W)

STIFF TO VERY STIFF SILTY CLAY (W)

C-243
37+81
CL -Y7-

BEGIN BRIDGE
-Y7- STA 37+81.34

PI = 40+20.00
EL = 69.80'
VC = 700'
K = 144

(+)0.3000%

(-)4.1552%

END BRIDGE
-Y7- STA 39+28.74

C-244
39+29
CL -Y7-

SOFT TO MEDIUM STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE (LOCAL MODERATELY) ORGANIC CLAYEY COARSE TO FINE SAND WITH TRACE OF SILT
(W)

S-31
HYS-25

C-245
42+00
CL -Y7-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

SEE SHEETS 15 & 37 FOR -Y7- PLANVIEW

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(psf)	$S_{REMOLDED}$ (psf)
HVS-25	42+00	0 ft CL	-Y7-	1.0 - 1.5	1337	209

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-31	42+00	0 ft CL	-Y7-	1.0 - 1.5	A-2-4 (0)	20	NP	25	53	8	14	100	94	75	24		5.7

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	64
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM229 ELEVATION = 28.80'
-Y7- STA 54+16.48 40' RT
RR SPIKE IN BASE OF 18" PINE

-Y7-

PI = 40+20.00
EL = 69.80'
VC = 700'
K = 144

(-)4.5520%

PI = 49+00.00
EL = 29.74'
VC = 600'
K = 123

(-)4.6520%

(+)0.3200%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

END GRADE
-Y7- STA 55+00.00
EL = 31.66'

C-246
44+00
C/L -Y7-

C-247
46+00
C/L -Y7-

C-249
50+00
C/L -Y7-

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE BLACK MODERATELY ORGANIC CLAYEY COARSE TO FINE SAND WITH TRACE OF SILT
(W)

SOFT TO MEDIUM STIFF FINE SANDY SILTY CLAY
(W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

10/2006

SEE SHEET 37 FOR -Y7- PLANVIEW

-RAMP B2-

BEGIN GRADE
-RP B2- STA 10+00.00
EL = 54.50'

PI = 11+70.00
EL = 50.86'
VC = 140'
K = 211

PI = 13+20.00
EL = 48.67'
VC = 160'
K = 117

PI = 14+50.00
EL = 46.47'
VC = 90'
K = 135

PI = 16+00.00
EL = 44.94'
VC = 200'
K = 115

PI = 23+00.00
EL = 39.72'
VC = 200'
K = 162

(-)12.1326%
(-)11.4700%
(-)11.4700%
(-)11.6931%
(-)11.6931%
(-)11.0250%
(-)10.7454%
(-)10.7454%
(+)10.4977%

EXISTING GROUND PROFILE

PROPOSED GRADE LINE

C-214
17+00
C/L -RP 2B-

C-215
19+00
C/L -RP 2B-

C-216
21+00
C/L -RP 2B-

C-217
23+00
C/L -RP B2-

SOFT TO MEDIUM STIFF SILTY CLAY
(W)

VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

SOFT TO MEDIUM STIFF SILTY CLAY
(W)

VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(W - SAT.)

10/2006

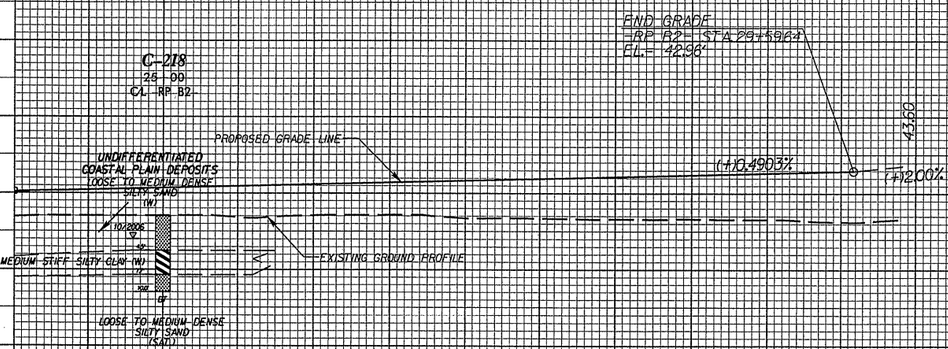
SEE SHEETS 14 & 15 FOR -RAMP B2- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	65
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

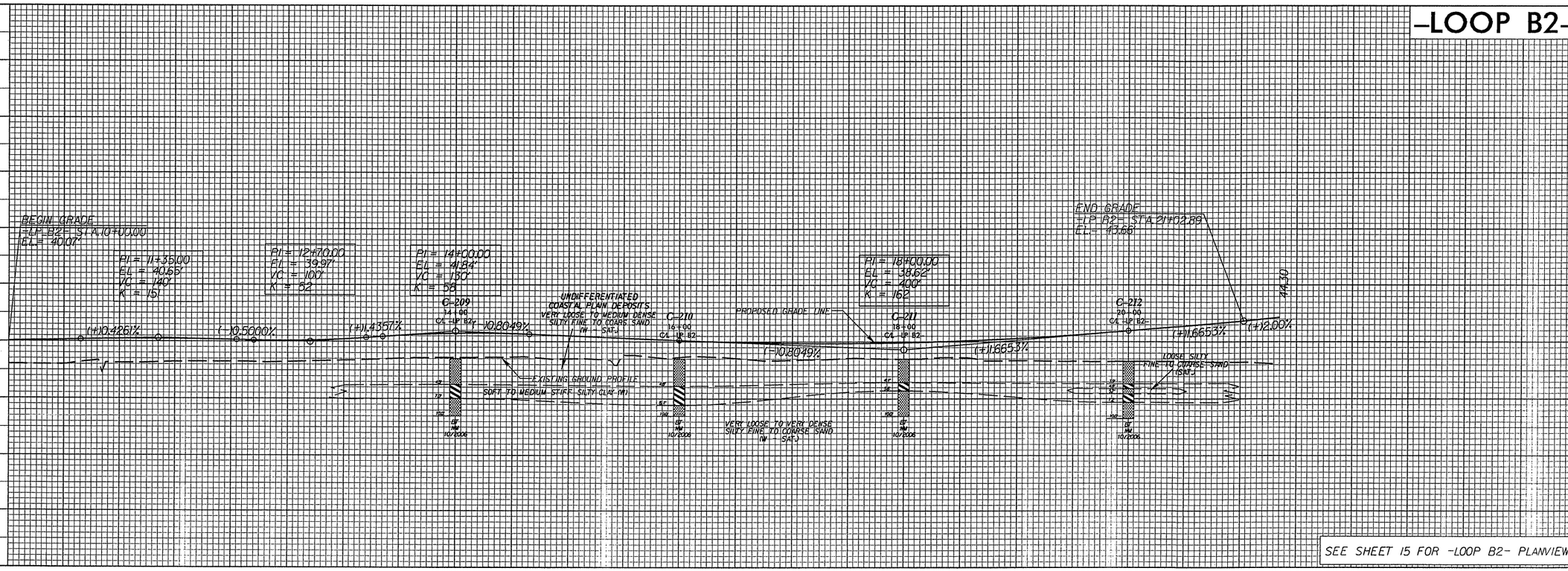
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP B2-



SEE SHEET 15 FOR -RAMP B2- PLANVIEW

-LOOP B2-



SEE SHEET 15 FOR -LOOP B2- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	66
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-RAMP C2-

BEGIN GRADE
-RP_C2- STA.10+00.00
ELL= 45.81'

PROPOSED GRADE LINE

C-221
12+00
CL -RP C2-

C-222
14+00
CL -RP C2-

45.31'

C-223
16+00
CL -RP C2-

PI = 17+00.00
EL = 41.69'
VC = 550'
K = 98

(-)10.5888%

(+)5.0000%

EXISTING GROUND PROFILE

C-224
18+00
CL -RP C2-

PROPOSED GRADE LINE

PI = 17+00.00
EL = 41.69'
VC = 550'
K = 98

(+)5.0000%

(-)10.6311%

C-225
20+00
CL -RP C2

C-226
22+00
CL -RP C2-

C-227
24+00
CL -RP C2-

SOFT TO MEDIUM STIFF SILTY CLAY (W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE (ONLY)
FINE TO COARSE SAND
(W - SAT)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

LOOSE TO MEDIUM DENSE
CLAYEY FINE TO COARSE SAND
WITH CLAY LAYERS
(SAT)

VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

10/2006

SEE SHEET 15 FOR -RAMP C2- PLANVIEW

-RAMP C2-
-RAMP D2-

END GRADE
-RP_C2- STA.26+36.44
ELL= 69.00'

PROPOSED GRADE LINE

(-)2.3829%

C-227
24+00
CL -RP C2-

LOOSE TO MEDIUM DENSE
CLAYEY FINE TO COARSE SAND
WITH CLAY LAYERS
(SAT)

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

BEGIN GRADE
-RP_D2- STA.10+00.00
ELL= 37.18'

PI = 12+90.00
EL = 38.73'
VC = 390'
K = 468

(+)0.5330%

(-)0.3000%

PROPOSED GRADE LINE

C-228
15+00
CL -RP D2

PI = 17+15.00
EL = 37.45'
VC = 460'
K = 98

PROPOSED GRADE LINE

(-)0.3000%

(+)4.4155%

C-229
17+00
CL -RP D2

C-230
19+00
CL -RP D2

EXISTING GROUND PROFILE

EXISTING GROUND PROFILE

VERY SOFT TO SOFT
SILTY CLAY
(W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

10/2006

SEE SHEET 15 FOR -RAMP C2- PLANVIEW

SEE SHEETS 15 & 16 FOR -RAMP D2- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	67

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP D2-
-SVRD7-

END GRADE
-RP D2- STA 24+00.14
EL.= 67.70'

PROPOSED GRADE LINE

(+)2.50%

C-282
23+00
C/L -RP D2-

EXISTING GROUND PROFILE

10/2006
BZ
JM
BF

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

SEE SHEET 15 FOR -RAMP D2- PLANVIEW

BEGIN GRADE
-SVRD7- STA 10+14.55
EL.= 37.63'

PI = 11+40.00
EL = 41.40'
VC = 250'
K = 45

(+)3.00000%

(-)2.53125%

PI = 13+50.00
EL = 36.08'
VC = 170'
K = 79

PROPOSED GRADE LINE

(-)0.3863%

END GRADE
-SVRD7- STA 15+40.00
EL.= 35.35'

EXISTING GROUND PROFILE

SEE SHEETS 15 & 36 FOR -SVRD7- PLANVIEW

-SVRD8-

BEGIN GRADE
-SVRD8- STA 31+50.00
EL.= 35.65'

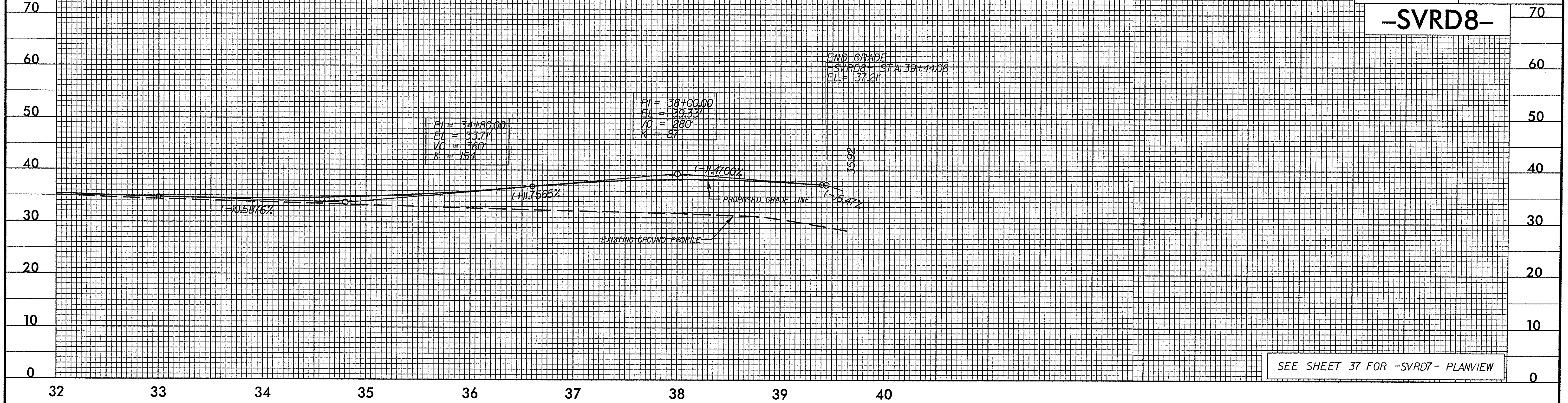
EXISTING GROUND PROFILE

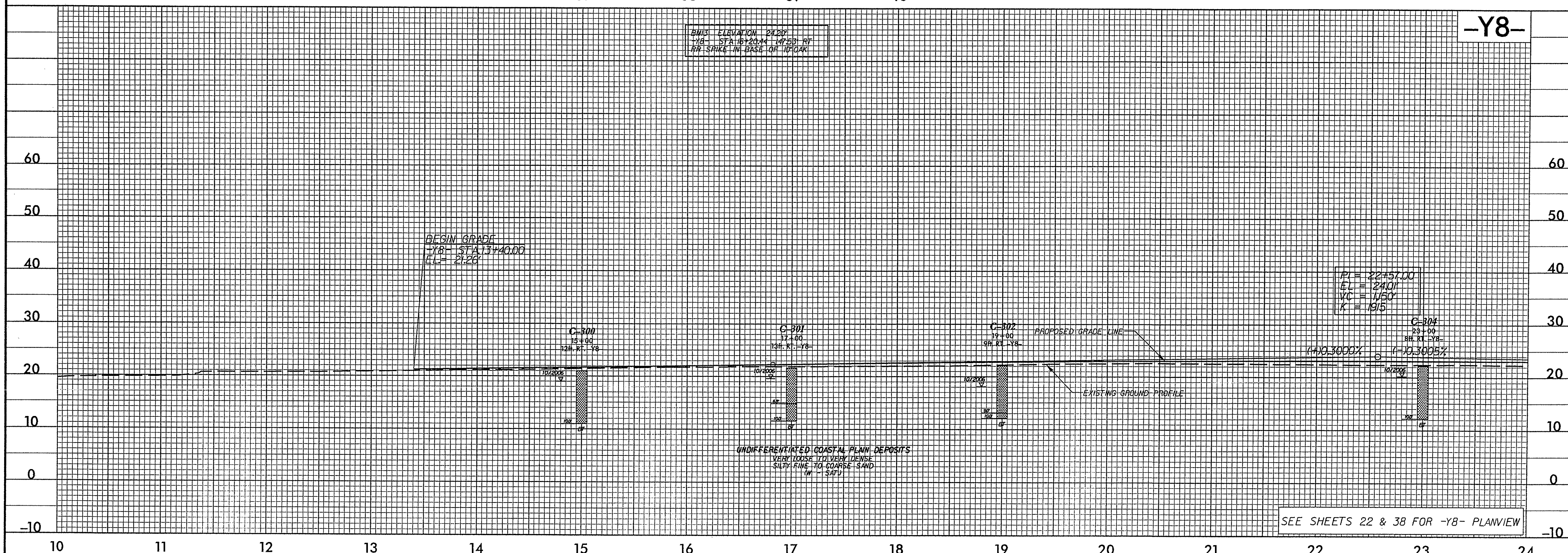
SEE SHEETS 15 & 37 FOR -SVRD7- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION





-Y8-
BM13 ELEVATION 24.20'
-Y8- STA 16+20.44 147.53' RT
RR SPIKE IN BASE OF 10" OAK
BEGIN GRADE
-Y8- STA 13+40.00
EL.= 21.26'
PI = 22+57.00
EL = 24.01'
VC = 1150'
K = 1915
C-300
15+00
12ft. RT. -Y8-
C-301
17+00
13ft. RT. -Y8-
C-302
19+00
9ft. RT. -Y8-
C-304
23+00
8ft. RT. -Y8-
10/2006
(+)0.3000%
(-)0.3005%
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT)
SEE SHEETS 22 & 38 FOR -Y8- PLANVIEW
60
50
40
30
20
10
0
-10
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	69

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

BM213 ELEVATION 2314'
-Y8- STA 37+49.14 114.30' LT.
RR SPIKE IN BASE OF 20" PINE

-Y8-

PI = 29+10.00
EL = 22.04'
VC = 140'
K = 228

PI = 33+10.00
EL = 23.30'
VC = 800'
K = 917

PI = 38+10.00
EL = 21.80'
VC = 140'
K = 233

C-305
25+00
88ft. RT. -Y8-

C-306
27+00
48ft. LT. -Y8-

C-307
31+00
41ft. LT. -Y8-

C-308
33+00
49ft. LT. -Y8-

C-309
36+00
41ft. LT. -Y8-

C-310
38+00
45ft. LT. -Y8-

10/2006

(+)0.3005%

(+)0.3140%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

(+)0.3140%

(-)0.3000%

(-)0.3000%

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W = SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W = SAT.)

SEE SHEETS 22 & 39 FOR -Y8- PLANVIEW

-Y8-

BM217 ELEVATION 11.48'
-Y8- STA 47+12.21 94.51' LT.
RR SPIKE IN BASE OF 18" PINE

PI = 38+10.00
EL = 21.80'
VC = 140'
K = 233

PI = 39+60.00
EL = 22.25'
VC = 160'
K = 116

PI = 41+50.00
EL = 20.20'
VC = 200'
K = 6309

PI = 43+50.00
EL = 18.10'
VC = 200'
K = 267

PI = 5+80.00
EL = 15.61'
VC = 270'
K = 154

C-310
38+00
45ft. LT. -Y8-

C-311
40+00
45ft. LT. -Y8-

C-312
42+00
45ft. LT. -Y8-

C-316
50+40
64ft. LT. -Y8-

C-317
52+00
64ft. LT. -Y8-

10/2006

11/2006

(+)0.3000%

(-)0.7789%

(-)1.0500%

STIFF SILTY CLAY (W)

(-)0.3000%

BEGIN BRIDGE
-Y8- STA 47+20.00

END BRIDGE
-Y8- STA 50+40.00

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

(-)0.3000%

(+)0.0883%

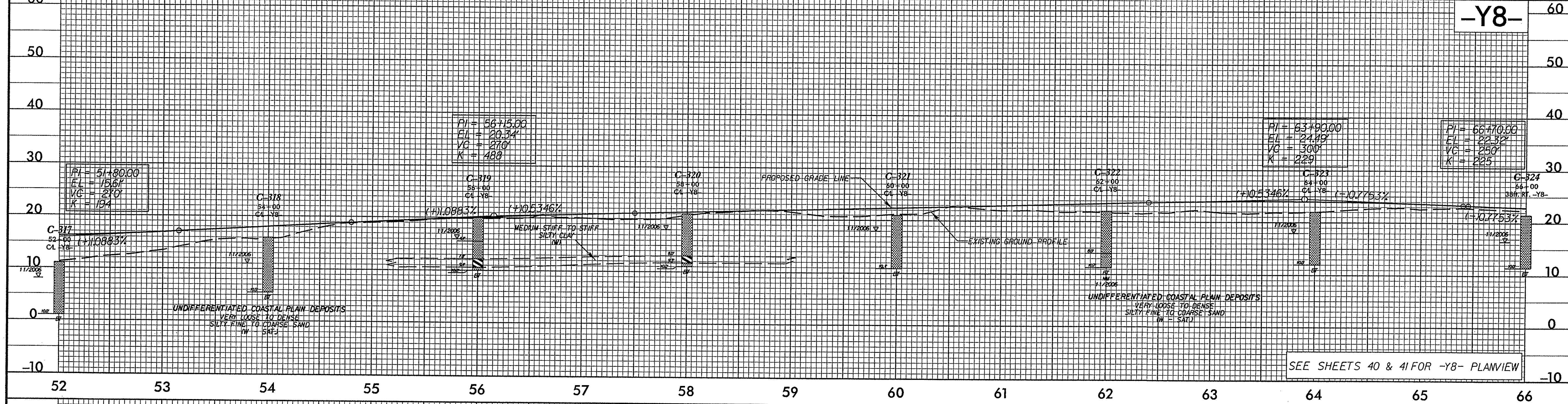
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W = SAT.)

SEE SHEETS 39 & 40 FOR -Y8- PLANVIEW

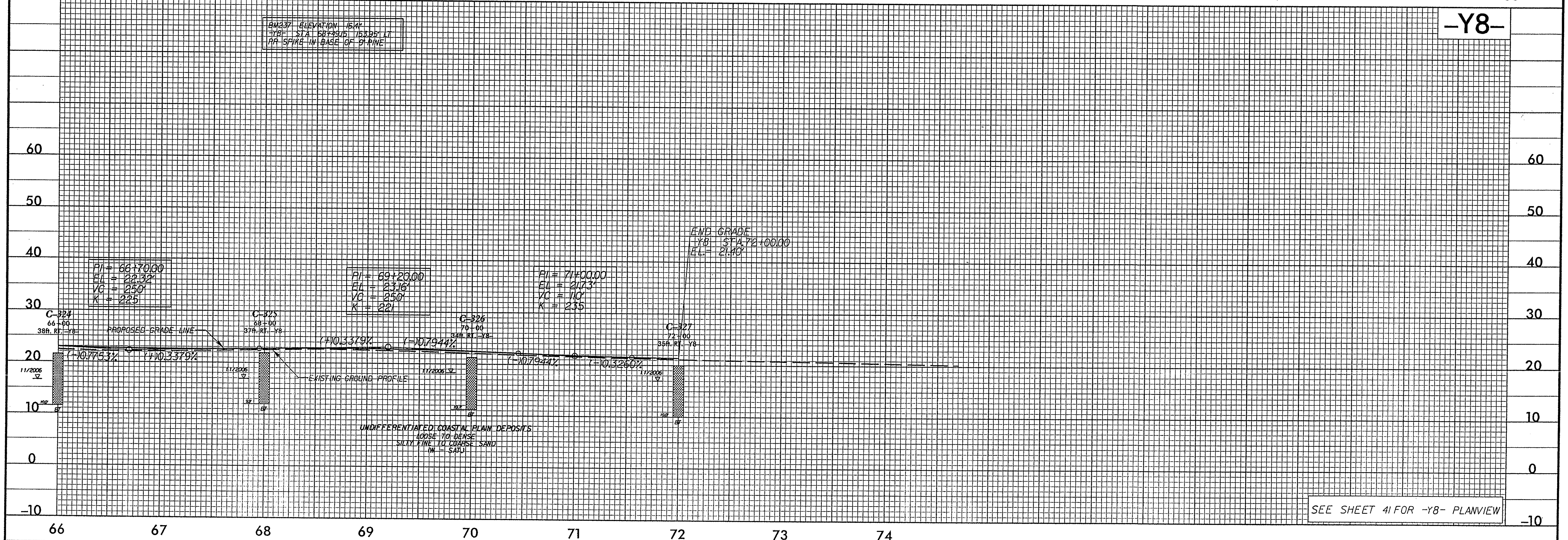
PROJECT REFERENCE NO.	SHEET NO.
R-2633B	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



-Y8-
BM235 ELEVATION 14.24'
-Y8- STA 52+96.29 62.75' LT
RR SPIKE IN BASE OF 10" PINE
PI = 51+80.00
EL = 15.61'
VC = 210'
K = 194
PI = 56+15.00
EL = 20.34'
VC = 270'
K = 488
PI = 63+90.00
EL = 24.49'
VC = 300'
K = 229
PI = 66+70.00
EL = 22.32'
VC = 250'
K = 225
C-317
C-318
C-319
C-320
C-321
C-322
C-323
C-324
(+)1.0883%
(+)0.5346%
(-)0.7753%
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
MEDIUM STIFF TO STIFF SILTY CLAY
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO DENSE
SILTY FINE TO COARSE SAND
(W - SAT)
SEE SHEETS 40 & 41 FOR -Y8- PLANVIEW



-Y8-
BM237 ELEVATION 16.41'
-Y8- STA 68+49.6 153.95' LT
RR SPIKE IN BASE OF 9" PINE
PI = 66+70.00
EL = 22.32'
VC = 250'
K = 225
PI = 69+20.00
EL = 23.16'
VC = 250'
K = 221
PI = 71+00.00
EL = 21.73'
VC = 110'
K = 235
END GRADE
-Y8- STA 72+00.00
EL = 21.40'
C-324
C-325
C-326
C-327
(-)0.7753%
(+)0.3379%
(-)0.7944%
(+)0.3260%
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO DENSE
SILTY FINE TO COARSE SAND
(W - SAT)
SEE SHEET 41 FOR -Y8- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	71
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP A3-

BEGIN GRADE
-RP A3- STA 10+00.00
ELEV. = 24.67'

PI = 11+43.00
EL = 24.53'
VC = 285'
K = 176

(-)0.0944%

(+)1.1867%

C-267
15+00
C/L -RP A3-

EXISTING GROUND PROFILE

SOFT TO MEDIUM STIFF SILTY CLAY (W)

9/2006

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

PI = 15+00.00
EL = 28.77'
VC = 380'
K = 429

(+)1.1867%

(+)0.3000%

PROPOSED GRADE LINE

C-268
17+00
C/L -RP A3-

PI = 18+70.00
EL = 29.86'
VC = 360'
K = 599

(+)0.3000%

(-)0.3010%

C-269
19+00
C/L -RP A3-

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

PROPOSED GRADE LINE

C-270
21+00
C/L -RP A3-

10/2006

MEDIUM STIFF SILTY CLAY (W)

C-271
23+00
C/L -RP A3-

10/2006

SEE SHEETS 22 & 23 FOR -RAMP A3- PLANVIEW

-RAMP A3-

PI = 25+10.00
EL = 27.05'
VC = 200'
K = 534

(-)0.3010%

(-)0.9000%

C-273
27+00
C/L -RP A3

PROPOSED GRADE LINE

C-274
29+00
C/L -RP A3

10/2006

EXISTING GROUND PROFILE

10/2006

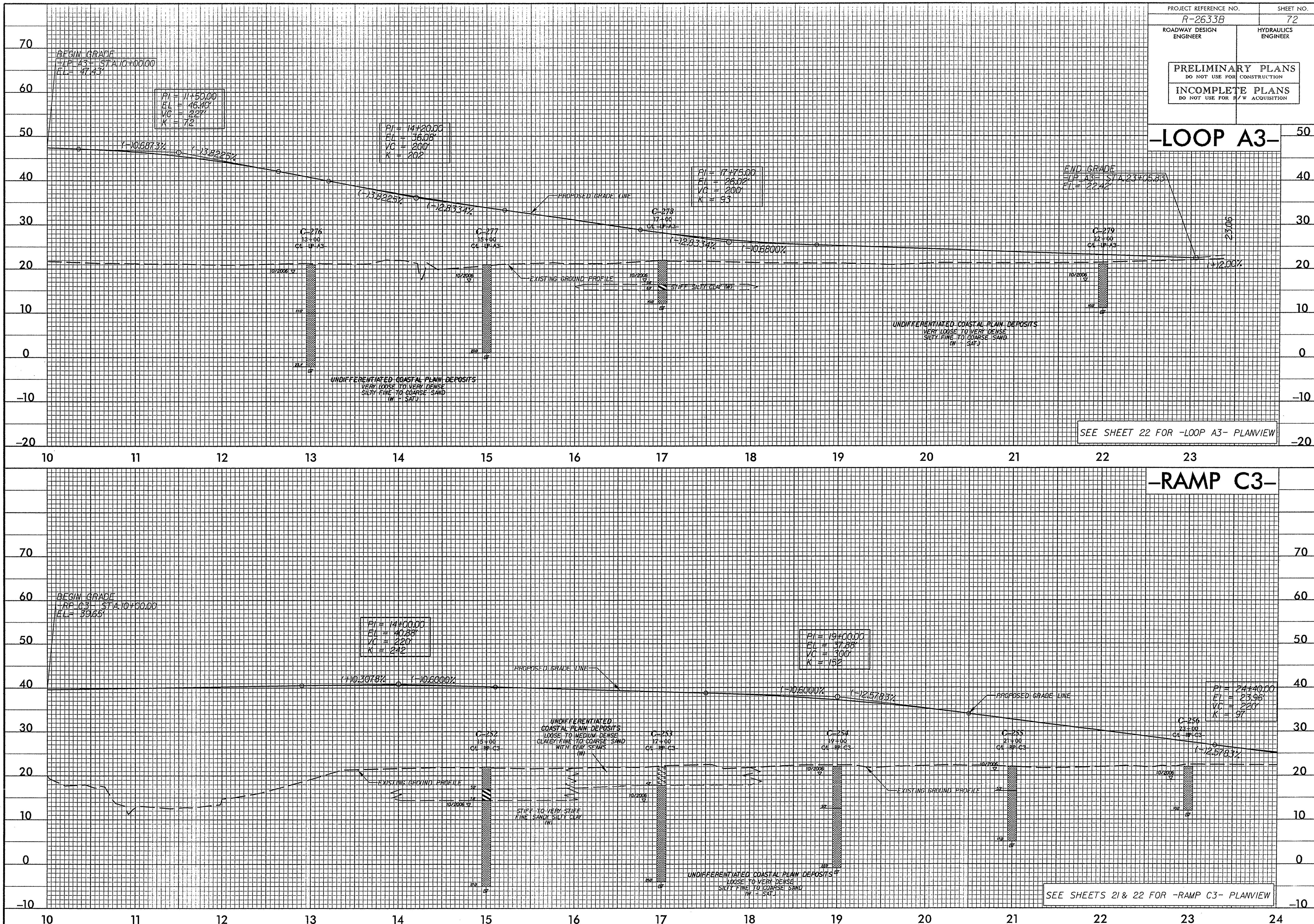
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO MEDIUM DENSE
SILTY FINE TO COARSE SAND
(W - SAT)

END GRADE
-RP A3- STA 31+22.97
EL = 22.43'

23.08

(+)2.00%

SEE SHEET 22 FOR -RAMP A3- PLANVIEW


PROJECT REFERENCE NO.
R-2633B
SHEET NO.
72
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
-LOOP A3-
BEGIN GRADE
-LP A3- STA.10+00.00
EL= 47.43'
PI = 11+50.00
EL = 46.40'
VC = 227'
K = 72
PI = 14+20.00
EL = 36.08'
VC = 200'
K = 202
PI = 17+75.00
EL = 26.02'
VC = 200'
K = 93
END GRADE
-LP A3- STA.23+05.83
EL= 22.42'
(-)0.6873%
(-)3.8225%
(-)3.8225%
(-)2.8334%
(-)2.8334%
(-)0.6800%
(+)2.00%
23.06
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
STIFF SILTY CLAY (W)
C-276
13+00
CL -LP-A3-
C-277
15+00
CL -LP-A3-
C-278
17+00
CL -LP-A3-
C-279
22+00
CL -LP-A3-
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
SEE SHEET 22 FOR -LOOP A3- PLANVIEW
-RAMP C3-
BEGIN GRADE
-RP C3- STA.10+00.00
EL= 39.65'
PI = 14+00.00
EL = 40.88'
VC = 220'
K = 242
PI = 19+00.00
EL = 37.88'
VC = 300'
K = 152
PI = 24+40.00
EL = 23.96'
VC = 220'
K = 97
(+)0.3078%
(-)0.6000%
(-)0.6000%
(-)2.5783%
(-)2.5783%
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO MEDIUM DENSE
CLAYEY FINE TO COARSE SAND
WITH CLAY SEAMS
(W)
STIFF TO VERY STIFF
FINE SANDY SILTY CLAY
(W)
C-252
15+00
CL -RP-C3-
C-253
17+00
CL -RP-C3-
C-254
19+00
CL -RP-C3-
C-255
21+00
CL -RP-C3-
C-256
23+00
CL -RP-C3-
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
SEE SHEETS 21 & 22 FOR -RAMP C3- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	73

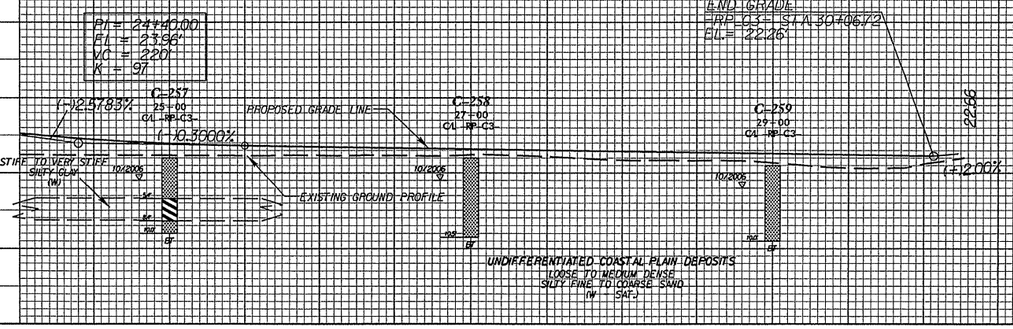
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

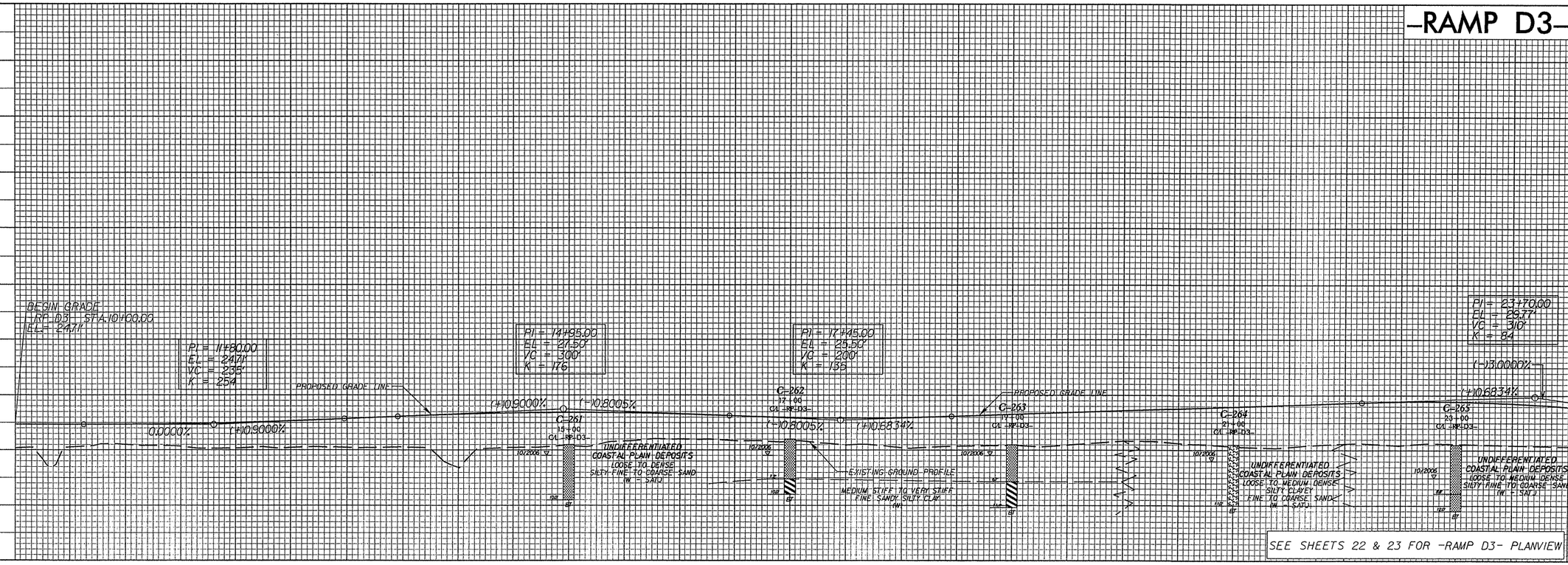
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP C3-



SEE SHEET 22 FOR -RAMP C3- PLANVIEW

-RAMP D3-



SEE SHEETS 22 & 23 FOR -RAMP D3- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	74

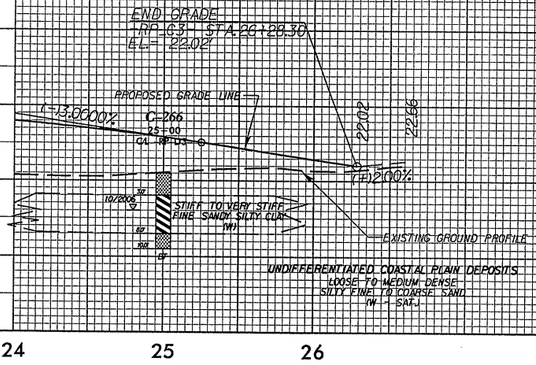
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

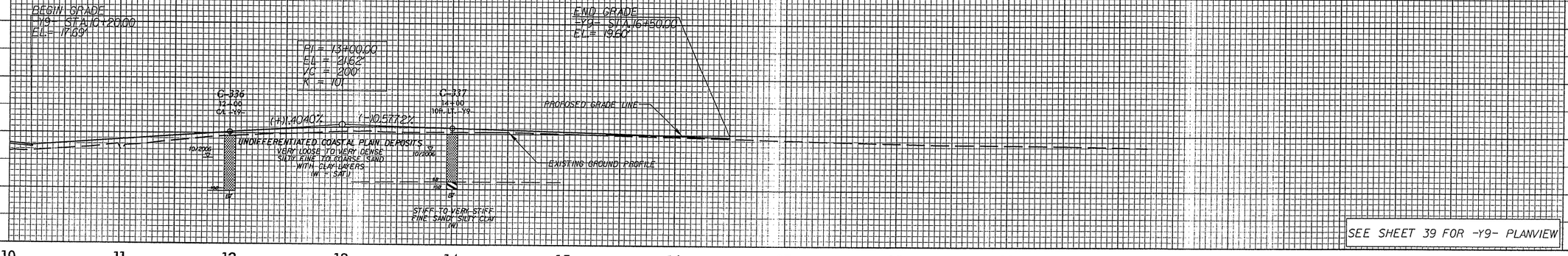
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP D3-



SEE SHEET 22 FOR -RAMP D3- PLANVIEW

-Y9-



SEE SHEET 39 FOR -Y9- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	75

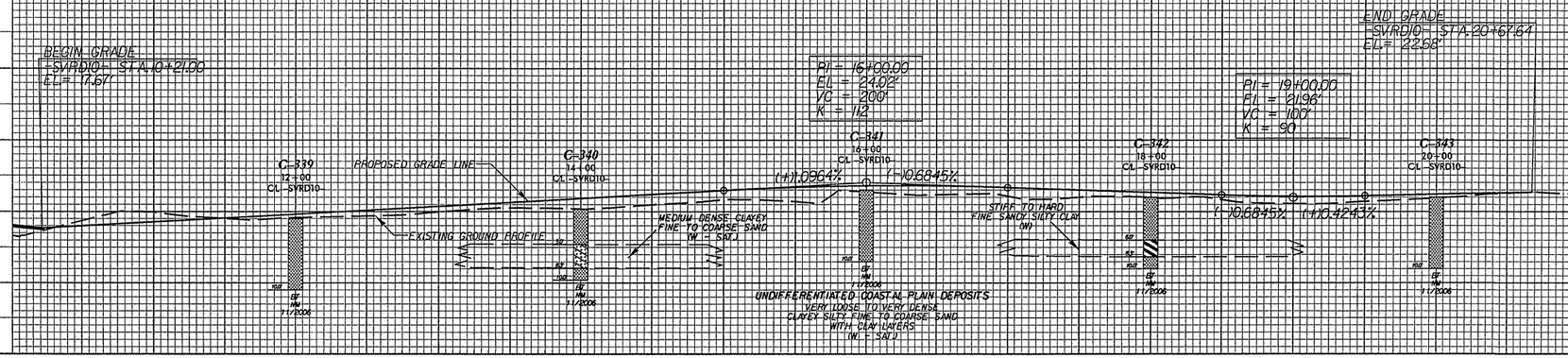
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

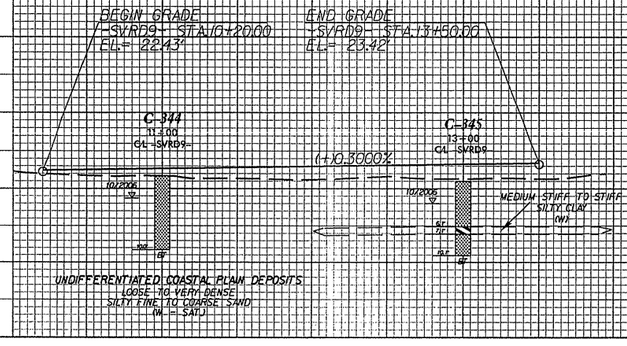
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-SVRD10-



SEE SHEETS 22 & 39 FOR -SVRD8- PLANVIEW

-SVRD9-



SEE SHEET 38 FOR -SVRD9- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	76

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

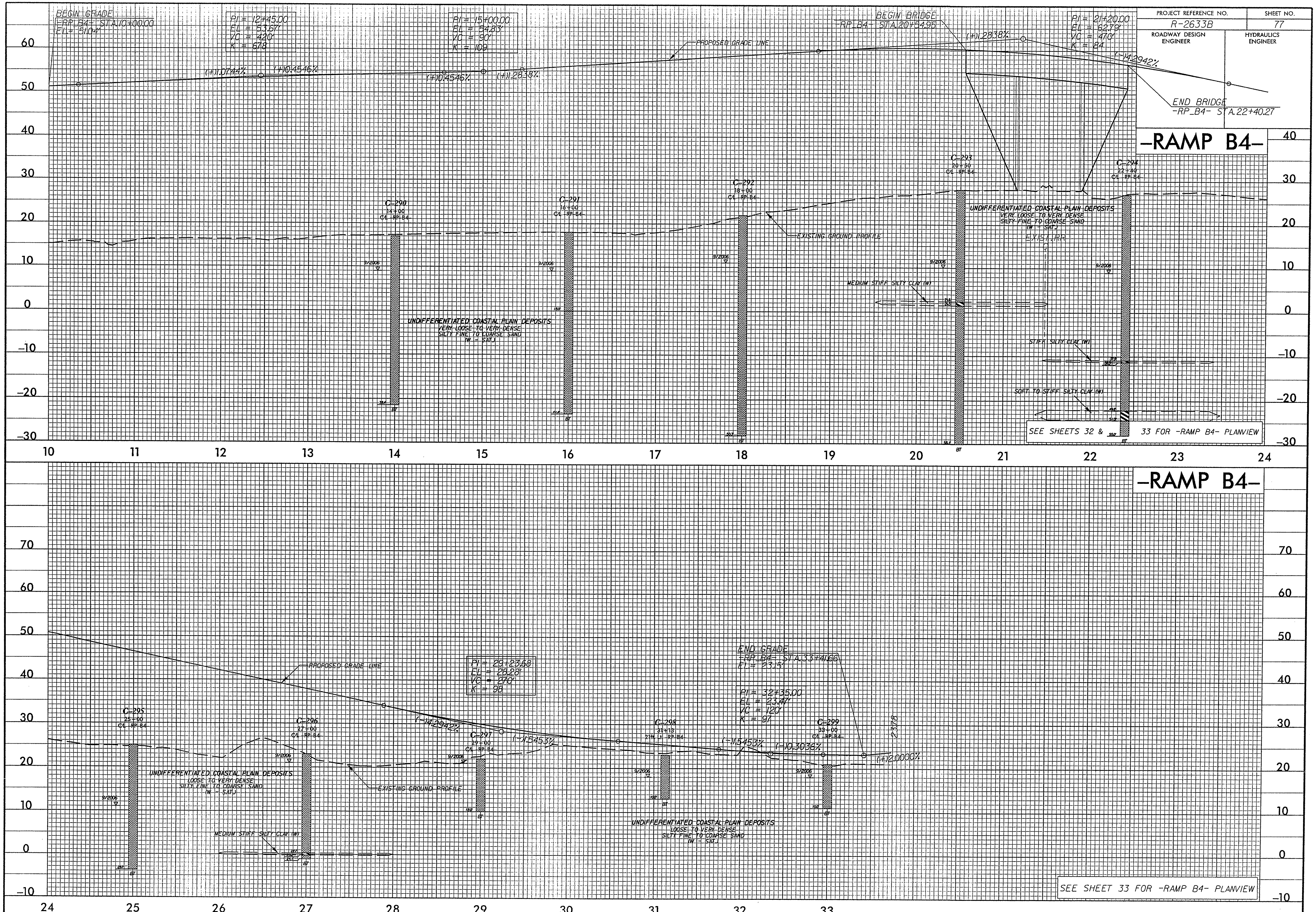
-Y8A-

SEE SHEET 38A FOR -Y8A- PLANVIEW

-Y8B-

SEE SHEET 38A FOR -Y8A- PLANVIEW

SEE SHEETS 22 & 38A FOR -Y8B- PLANVIEW


PROJECT REFERENCE NO.
R-2633B
SHEET NO.
77
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-RAMP B4-
BEGIN GRADE
-RP_B4- STA.10+00.00
EL= 51.04'
PI = 12+45.00
EL = 53.67'
VC = 420'
K = 678
PI = 15+00.00
EL = 54.83'
VC = 90'
K = 109
BEGIN BRIDGE
-RP_B4- STA.20+54.95
PI = 21+20.00
EL = 62.79'
VC = 470'
K = 84
END BRIDGE
-RP_B4- STA.22+40.27
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
(+)1.0744%
(+)0.4546%
(+)1.2838%
(-)4.2942%
C-290
C-291
C-292
C-293
C-294
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
MEDIUM STIFF SILTY CLAY (W)
STIFF SILTY CLAY (W)
SOFT TO STIFF SILTY CLAY (W)
EXIST. RR
SEE SHEETS 32 & 33 FOR -RAMP B4- PLANVIEW
-RAMP B4-
PI = 29+23.68
EL = 28.28'
VC = 270'
K = 98
END GRADE
-RP_B4- STA.33+41.66
EL = 23.51'
PI = 32+35.00
EL = 23.41'
VC = 120'
K = 97
(-)4.2942%
(-)1.5453%
(-)0.3036%
(+)2.0000%
C-295
C-296
C-297
C-298
C-299
UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)
MEDIUM STIFF SILTY CLAY (W)
PROPOSED GRADE LINE
EXISTING GROUND PROFILE
SEE SHEET 33 FOR -RAMP B4- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	78
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-RAMP C4-

BEGIN GRADE
-RP_C4- STA.10+00.00
EL.= 55.79'

PI = 11+00.00
EL = 54.66'
VC = 193'
K = 393

(+)0.8782%

(+)0.3874%

PROPOSED GRADE LINE

BEGIN BRIDGE
-RP_C4- STA.16+04.82

PI = 17+50.00
EL = 57.18'
VC = 380'
K = 85

(+)0.3874%

(-)4.1011%

END BRIDGE
-RP_C4- STA.17+47.07

PROPOSED GRADE LINE

PI = 25+00.00
EL = 26.42'
VC = 350'
K = 97

(-)4.1011%

C-280
11+00
C/L -RP_C4-

C-283
12+50
C/L -RP_C4-

C-284
19+00
C/L -RP_C4-

C-285
21+00
C/L -RP_C4-

C-286
23+18
Lt. L1 -RP_C4-

EXISTING GROUND PROFILE

EXIST. RR

ROADWAY EMBANKMENT FILL
LOOSE TO MEDIUM DENSE
SILTY FINE TO COARSE SAND

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W = SAT.)

9/2006

SEE SHEETS 32 & 33 FOR -RAMP C4- PLANVIEW

-RAMP C4-

END GRADE
-RP_C4- STA.27+05.63
EL.= 25.44'

PI = 25+00.00
EL = 26.42'
VC = 350'
K = 97

PROPOSED GRADE LINE

(-)4.1011%

C-287
25+00
C/L -RP_C4-

C-288
26+38
Lt. L1 -RP_C4

(-)0.4800%

(-)0.4800%

(+)2.0000%

EXISTING GROUND PROFILE

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W = SAT.)

9/2006

SEE SHEET 33 FOR -RAMP C4- PLANVIEW

PROJECT REFERENCE NO.	SHEET NO.
R-2633B	79
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y1-

BEGIN GRADE
-Y1- STA 34+77.68
EL= 21.68'

PI = 37+40.15
EL = 22.77'
VC = 115'
K = 72.3

(+)0.4176%

(+)0.2360%

PROPOSED GRADE LINE

EXISTING GROUND PROFILE

PI = 41+50.25
EL = 23.74'
VC = 131'
K = 110.9

(+)0.2360%

(+)0.3544%

PI = 46+25.97
EL = 25.43'
VG = 197'
K = 223.8

(+)0.3544%

(+)0.2665%

SEE SHEET 33 FOR -Y1- PLANVIEW

-Y1-

PI = 52+49.33
EL = 27.09'
VC = 131'
K = 17.88

PROPOSED GRADE LINE

(+)0.2665%

(+)0.3399%

EXISTING GROUND PROFILE

END GRADE
-Y1- STA 55+11.79
EL = 27.98'

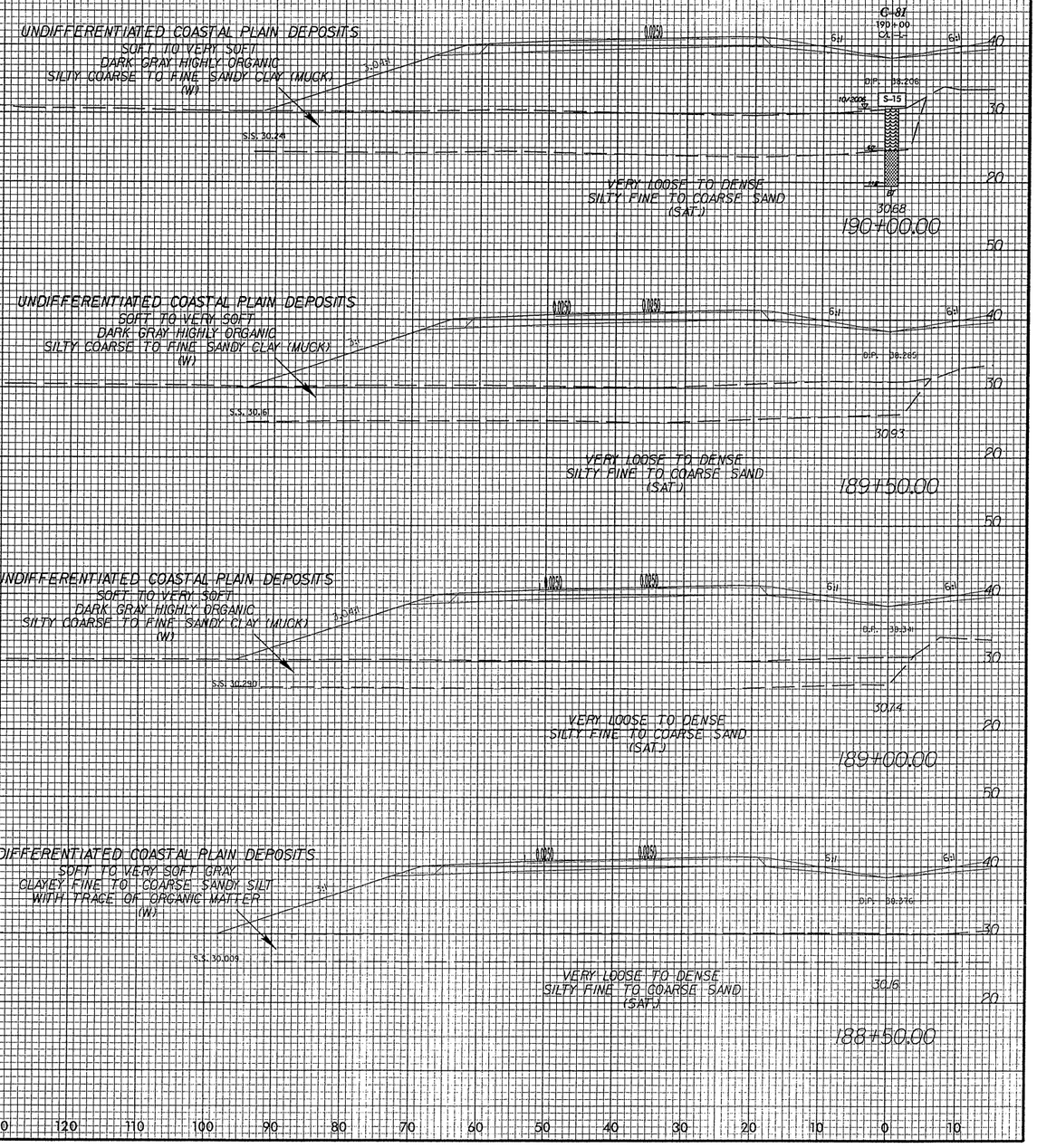
SEE SHEET 33 FOR -Y1- PLANVIEW

PROJ. REFERENCE NO.	SHEET NO.
R-2633B	80

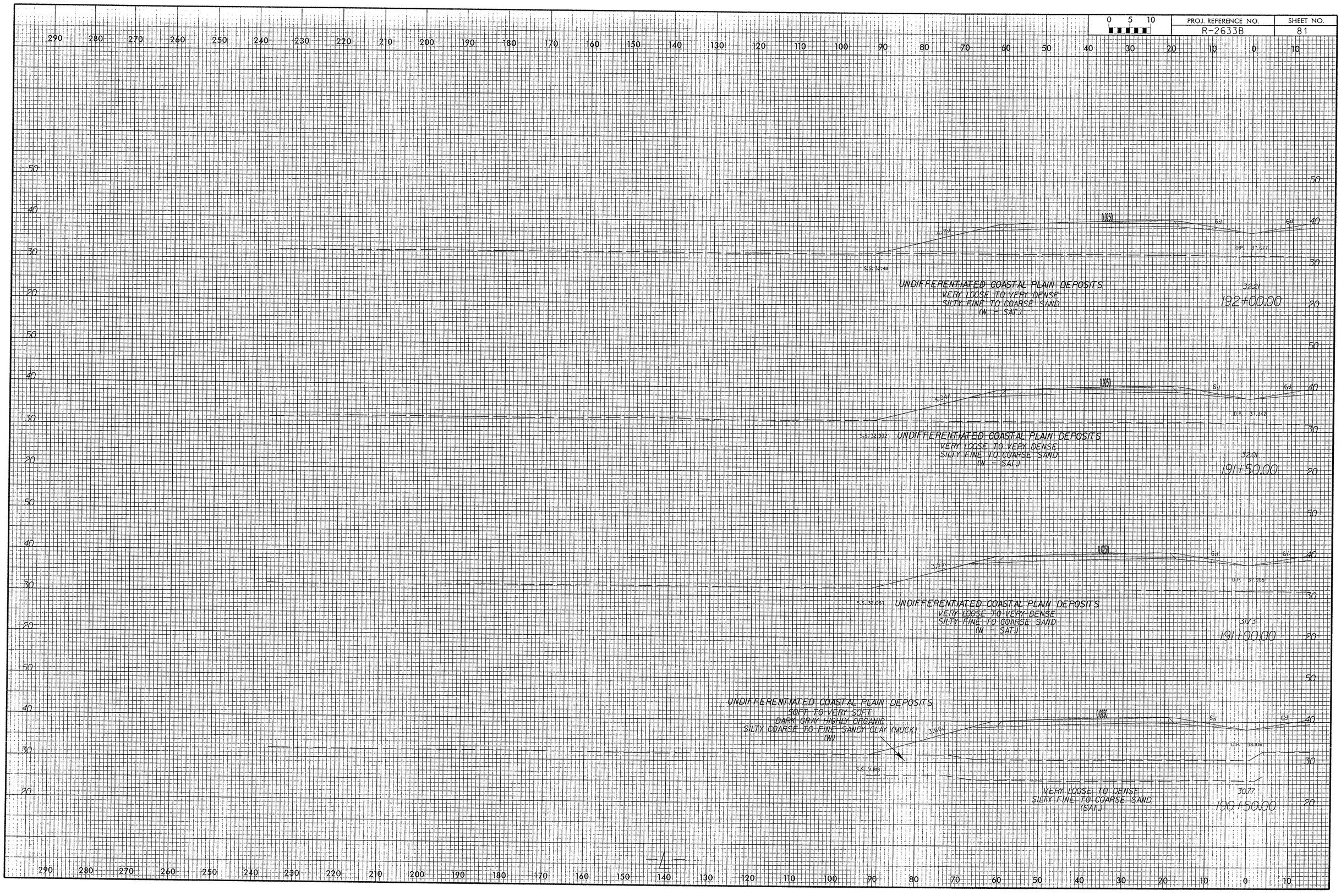
0 5 10

SOIL TEST RESULTS

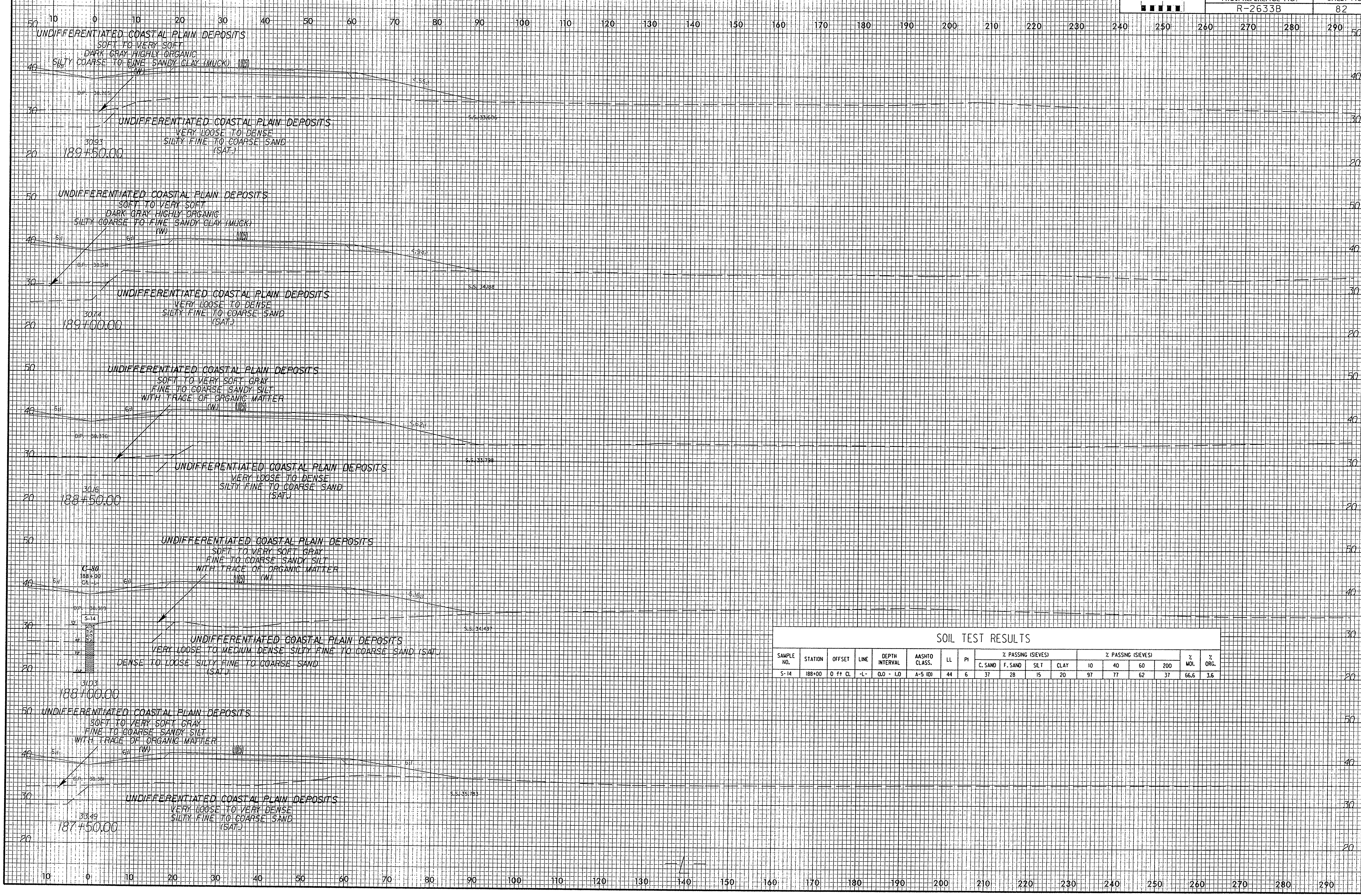
SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-15	190+00	0 ft CL	-L-	0.0 - 1.0	A-7-5 (0)	66	19	22	27	35	16	88	77	68	48	219.6	25.2



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2633B	81



PROJ. REFERENCE NO.	SHEET NO.
R-2633B	82



SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-14	188+00	0 ft CL	-L-	0.0 - 1.0	A-5 (0)	44	6	37	28	15	20	97	77	62	37	66.6	3.6

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2633B	83

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE DARK GRAY HIGHLY ORGANIC SILTY COARSE TO FINE SAND (MUCK)
(SAT.)

28J0
201+00.00
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY SOFT DARK GRAY
CLAYEY FINE TO COARSE SANDY SILT
WITH LITTLE ORGANIC MATTER
(W)

28J8
200+50.00
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY SOFT DARK GRAY
CLAYEY FINE TO COARSE SANDY SILT
WITH LITTLE ORGANIC MATTER
(W)

C-86
200+00
C1

28J5
200+00.00
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY SOFT DARK GRAY
CLAYEY FINE TO COARSE SANDY SILT
WITH LITTLE ORGANIC MATTER
(W)

28J1
199+50.00
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY SOFT DARK GRAY
CLAYEY FINE TO COARSE SANDY SILT
WITH LITTLE ORGANIC MATTER
(W)

28J4
199+00.00
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W - SAT.)

—1—

PROJ. REFERENCE NO.	SHEET NO.
R-2633B	84

0 5 10

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(W)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE DARK GRAY HIGHLY ORGANIC
SILTY COARSE TO FINE SAND (MUCK)
(SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE DARK GRAY HIGHLY ORGANIC
SILTY COARSE TO FINE SAND (MUCK)
(SAT.)

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS
VERY LOOSE DARK GRAY HIGHLY ORGANIC
SILTY COARSE TO FINE SAND (MUCK)
(SAT.)

C-88
204+00
CL -L-

VERY SOFT TO STIFF SILTY CLAY (W)

VERY LOOSE TO VERY DESNE SILTY FINE TO COARSE SAND (SAT.)

VERY SOFT TO STIFF SILTY CLAY (W)

VERY LOOSE TO VERY DESNE SILTY FINE TO COARSE SAND (SAT.)

VERY LOOSE TO VERY DESNE SILTY FINE TO COARSE SAND (SAT.)

VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(SAT.)

C-87
202+00
CL -L-

S-17
HVS-13

VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(SAT.)

VERY LOOSE TO VERY DENSE
SILTY FINE TO COARSE SAND
(SAT.)

HAND VANE SHEAR TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	S(pcf)	$S_{remolded}$ (pcf)
HVS-13	202+00	0 ft CL	-L-	1.0 - 1.5	940	115

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOI.	% ORG.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200		
S-17	202+00	0 ft CL	-L-	1.0 - 2.0	A-2-7 (0)	55	14	30	41	20	9	98	82	69	30		12.9

Cone Penetration Testing[1]

The cone penetration test (CPT) consists of hydraulically pushing a metal cone of specific dimensions into the ground. The CPT borings were performed using an integrated electronic cone system. The cone method used was designed in accordance with ASTM D 3341-94 having a tip area of 10 cm^2 and a sleeve friction area of 150 cm^2. The peizometer element consists of a 5 mm plastic porous element located immediately behind the cone tip. The cone utilized during this exploration is capable of measuring tip resistance, sleeve friction and dynamic pore pressures. Soil resistance at the cone tip and sleeve are measured by electronic sensors. The cone resistance, q_c, is the total force acting on the cone divided by the projected area of the cone; and the side friction, f_{sc}, is the total frictional force acting on the sleeve divided by its surface area. Data is typically expressed in terms of the friction ratio, R_f (f_{sc}/q_c x 100). Tip and sleeve values can be used to estimate soil properties and soil classification. Additional sensors can measure changes in pore pressure within the soil caused by the penetration of the cone. Pore pressures dissipation measurements were conducted at internals, which were noted to have an increase in the in-situ pore pressure during the real time soil property measurements of the cone.

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[1] Jefferies, M. G. and Davies M. P. (1993), "Use of CPT to Estimate Equivalent SPT N_{60}", Geotechnical Testing Journal , Philadelphia, Pennsylvania.

Robertson, P. K. (1989) "Soil Classification using Cone Penetration Test", Canadian Geotechnical Journal, Edmonton, Alberta.

Robertson, P. K. (1998) "Cone Penetration Testing for Geotechnical and Environmental Site Investigation", ConeTec Inc.

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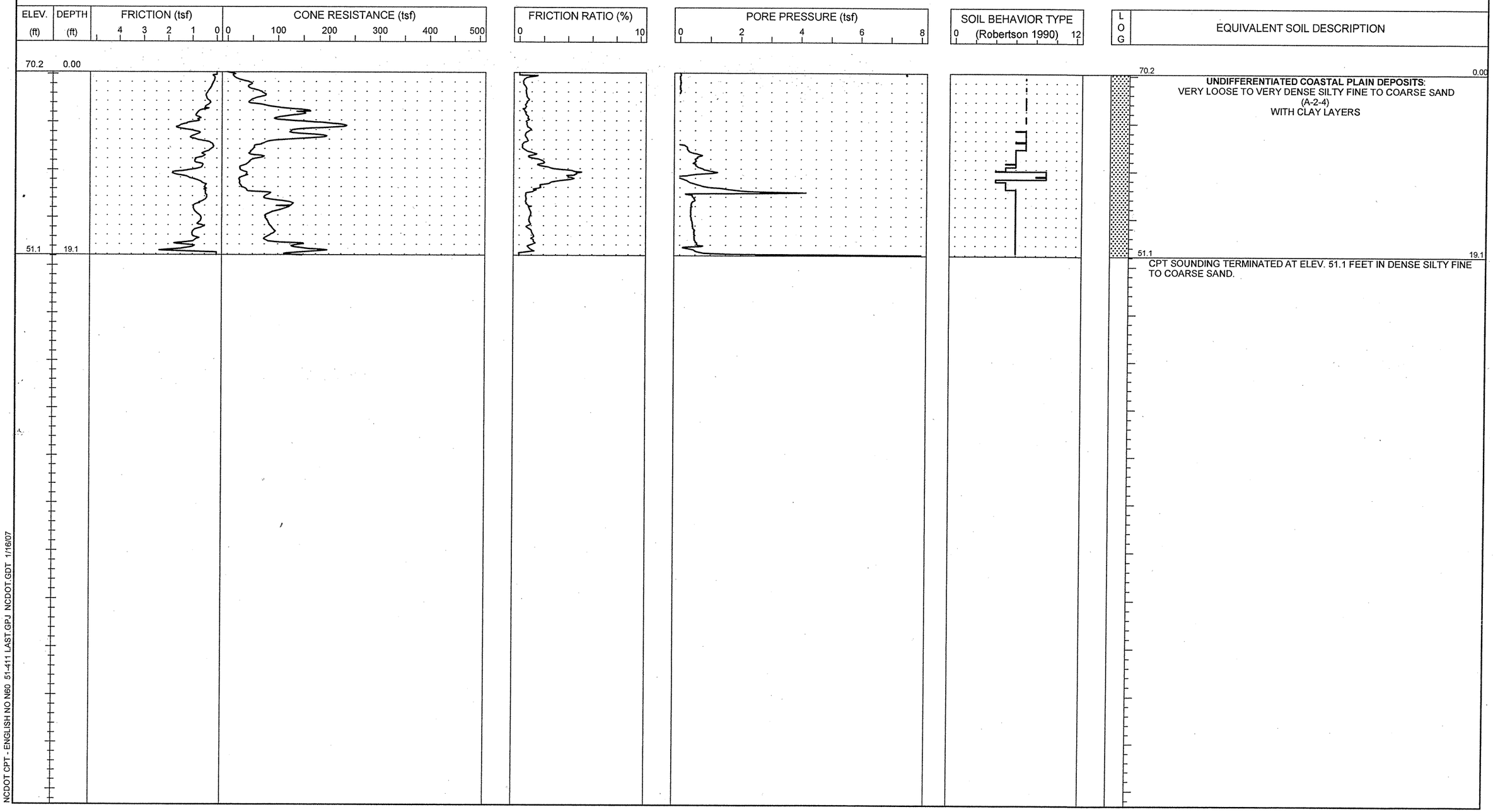
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 19.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 1	**BORING LOCATION** 24+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/9/06	**COMPLETED** 11/9/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 70.2 ft	**NORTHING** 184,829.9	**EASTING** 2,278,184.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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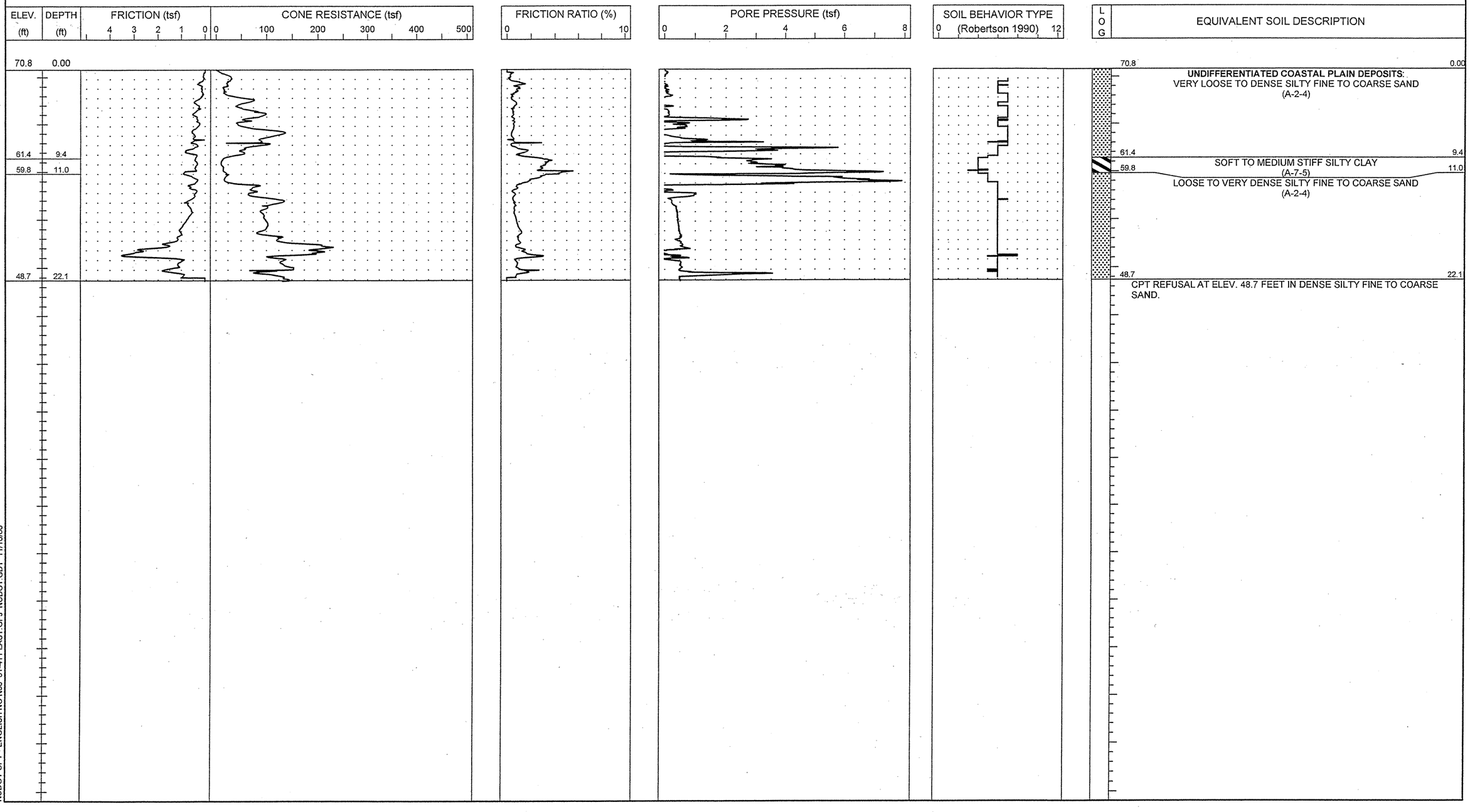
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 22.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 2	**BORING LOCATION** 26+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/9/06	**COMPLETED** 11/9/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 70.8 ft	**NORTHING** 185,026.7	**EASTING** 2,278,149.1	**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER		



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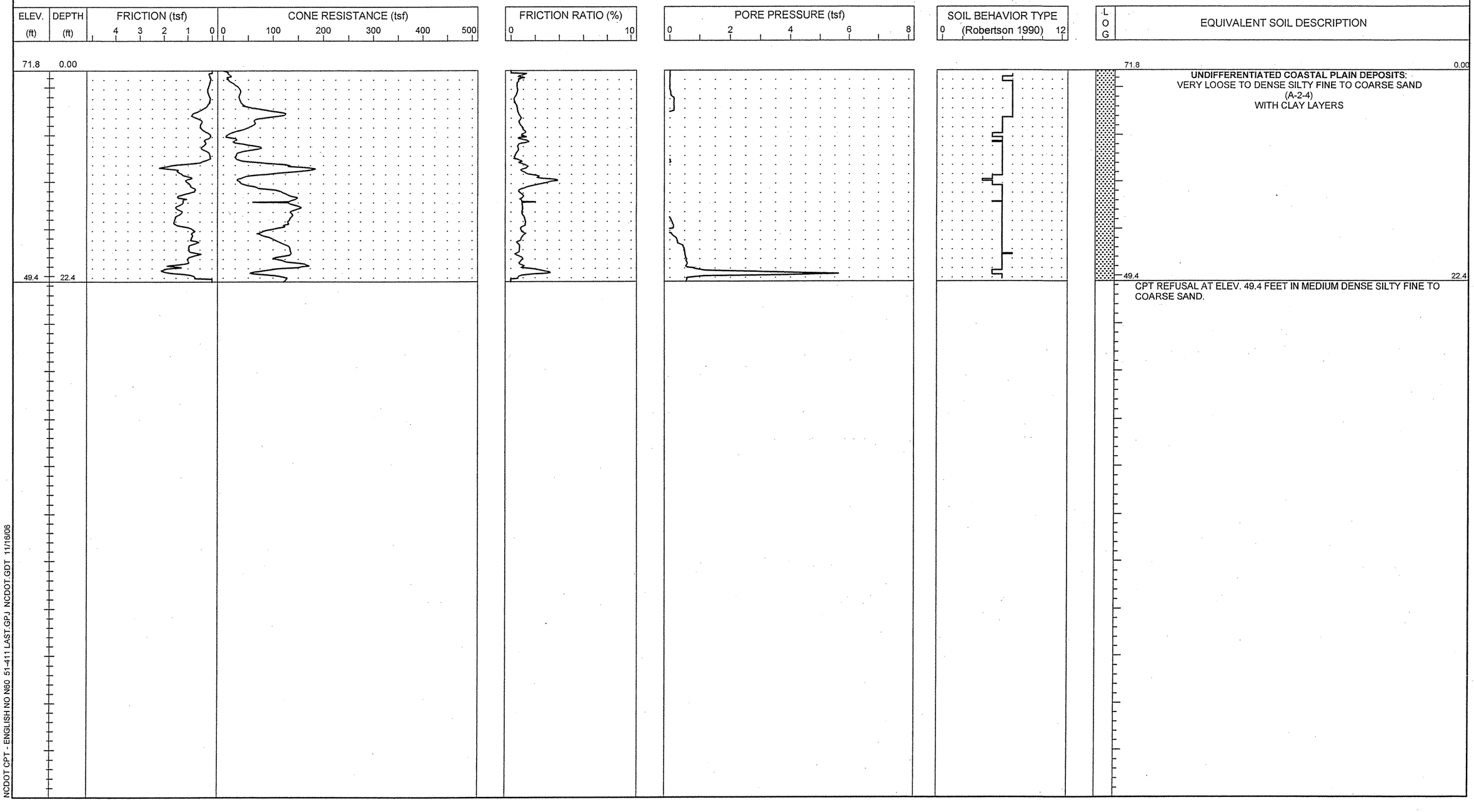
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 22.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 3	**BORING LOCATION** 28+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/9/06	**COMPLETED** 11/9/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 71.8 ft	**NORTHING** 185,224.2	**EASTING** 2,278,117.3		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



NCDOT CPT - ENGLISH NO N60 51-411 LAST.GPJ NCDOT.GDT 11/16/06

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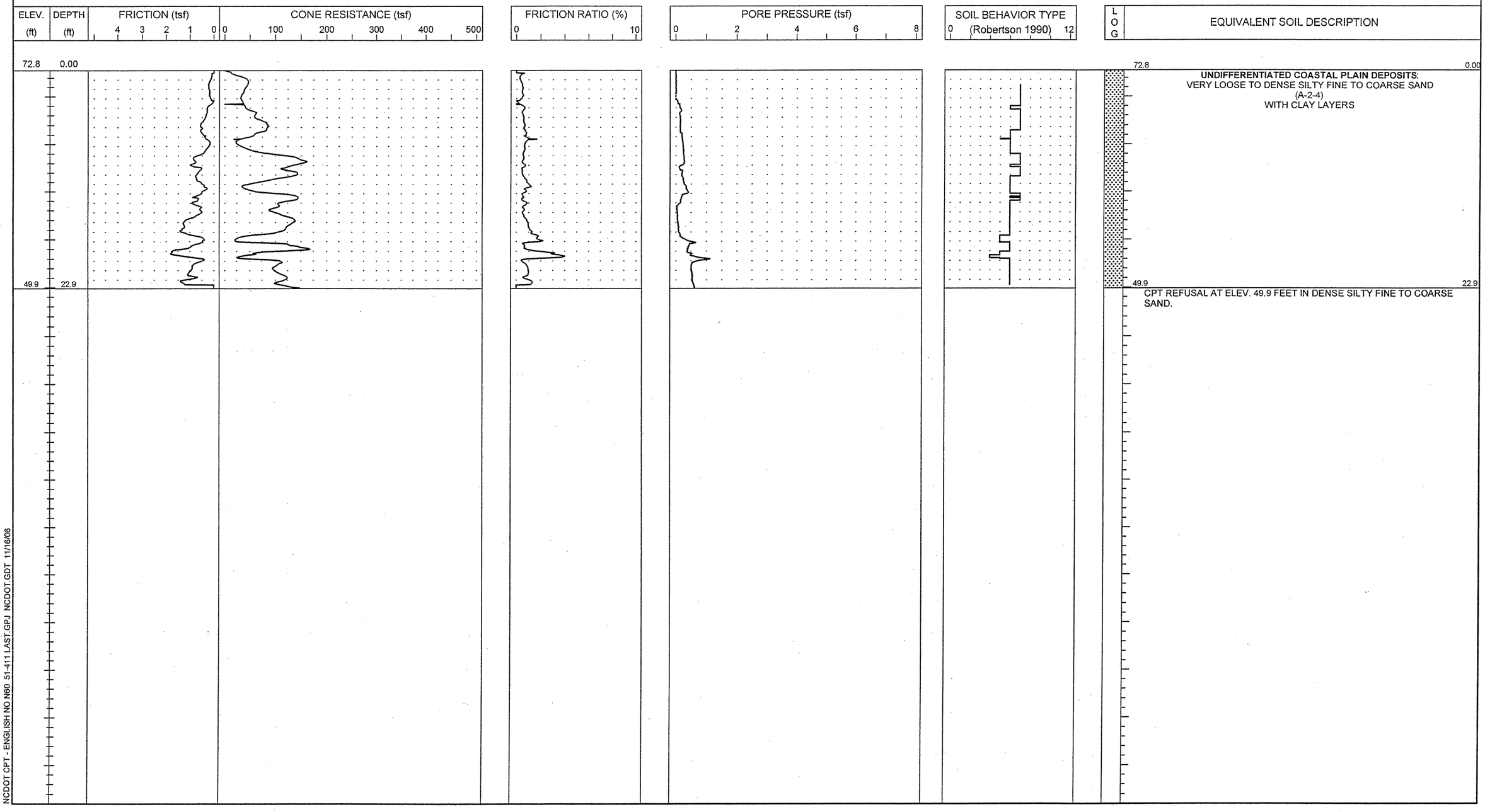
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 22.9 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 4	**BORING LOCATION** 30+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/8/06	**COMPLETED** 11/8/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 72.8 ft	**NORTHING** 185,422.2	**EASTING** 2,278,089.5	**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER		



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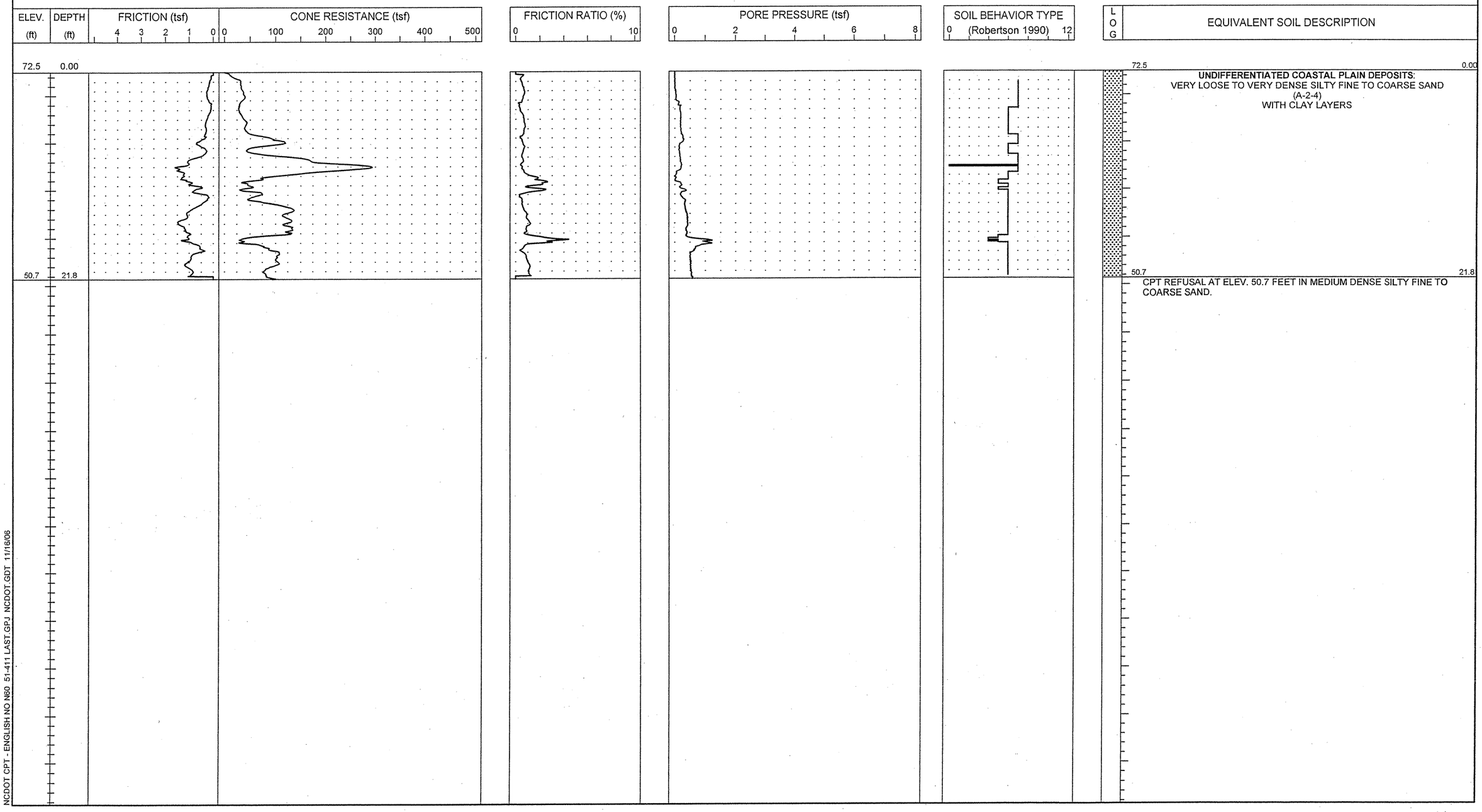
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 21.8 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 5	**BORING LOCATION** 32+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/8/06	**COMPLETED** 11/8/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 72.5 ft	**NORTHING** 185,620.8	**EASTING** 2,278,065.7		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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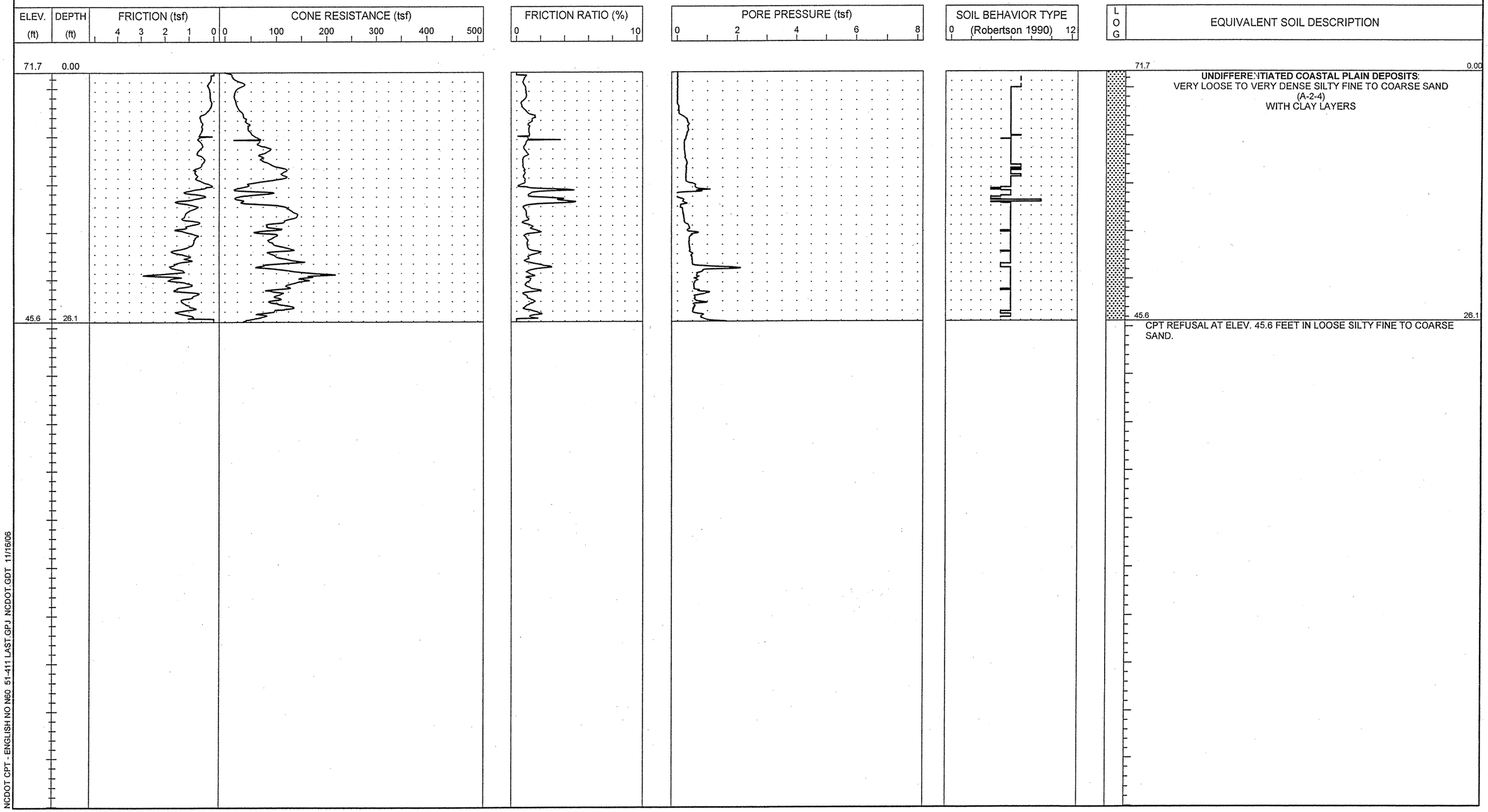
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 26.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 6	**BORING LOCATION** 34+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/8/06	**COMPLETED** 11/8/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 71.7 ft	**NORTHING** 185,819.8	**EASTING** 2,278,045.9		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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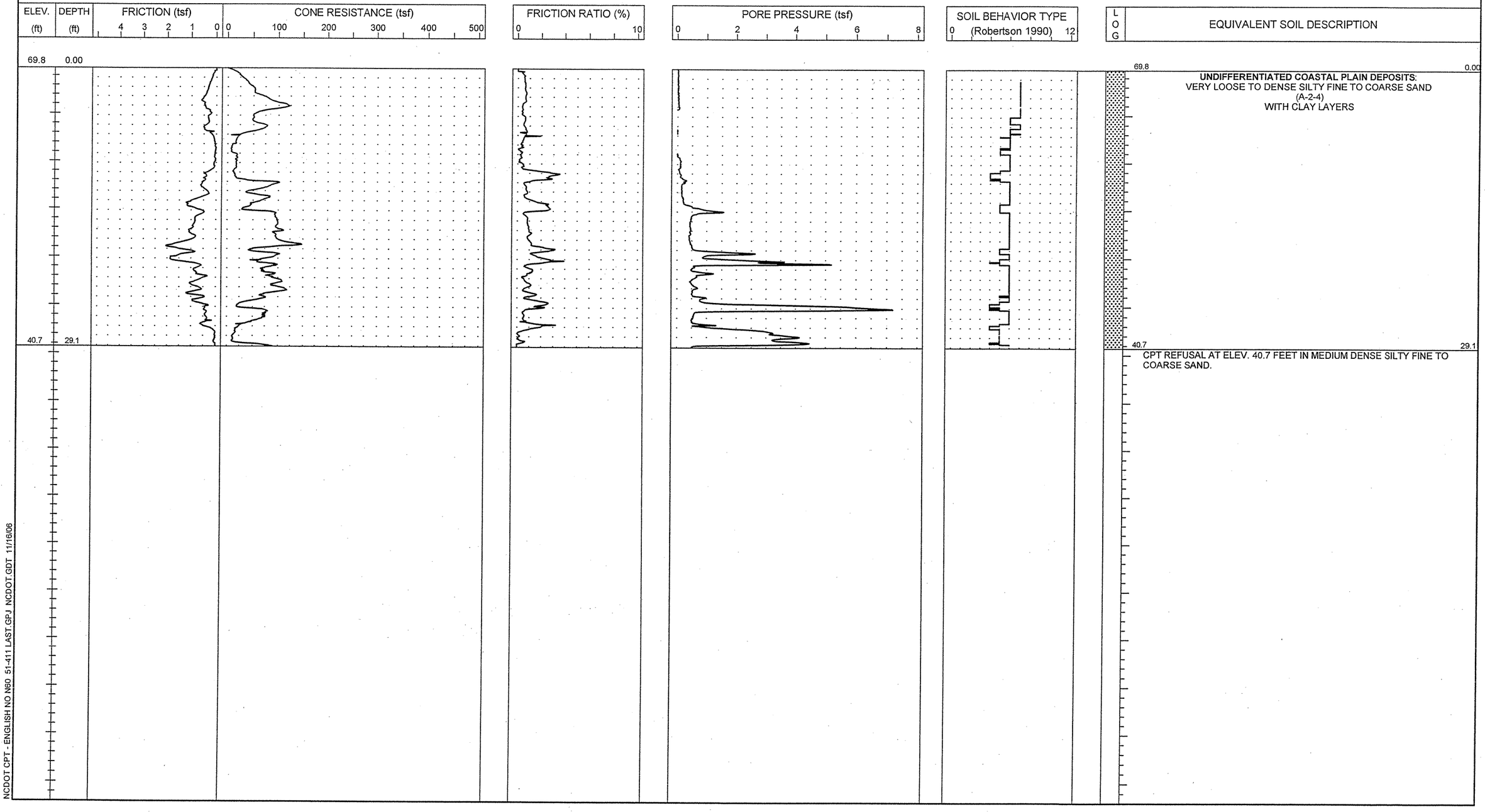
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 29.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 7	**BORING LOCATION** 35+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/8/06	**COMPLETED** 11/8/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 69.8 ft	**NORTHING** 185,919.5	**EASTING** 2,278,037.6		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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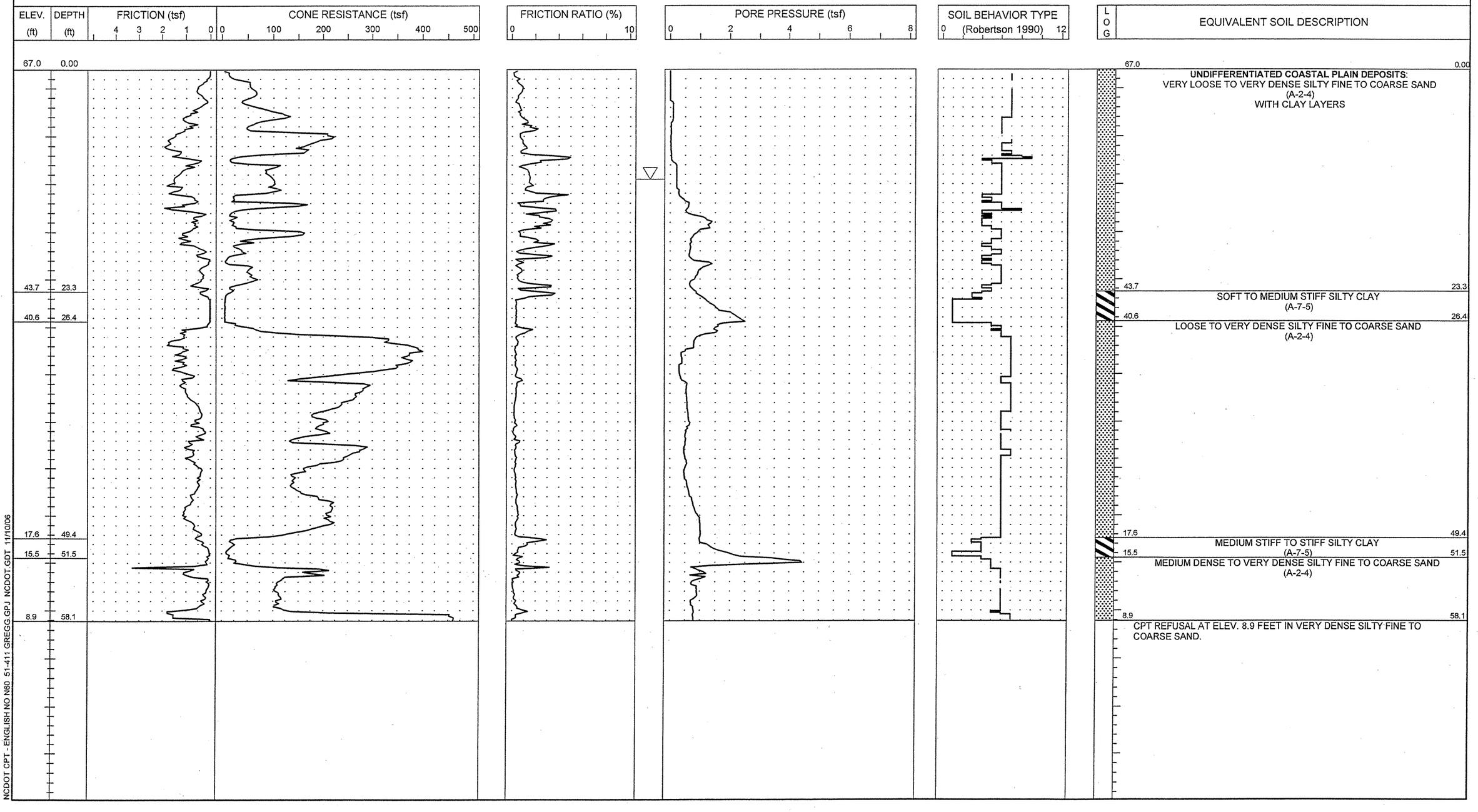
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 58.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 8	**BORING LOCATION** 41+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 11.5	**DATE STARTED** 10/20/06	**COMPLETED** 10/20/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 67.0 ft	**NORTHING** 186,518.7	**EASTING** 2,278,008.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN		



NCDOT CPT - ENGLISH NO N60 51-411 GREGG.GPJ NCDOT.GDT 11/10/06

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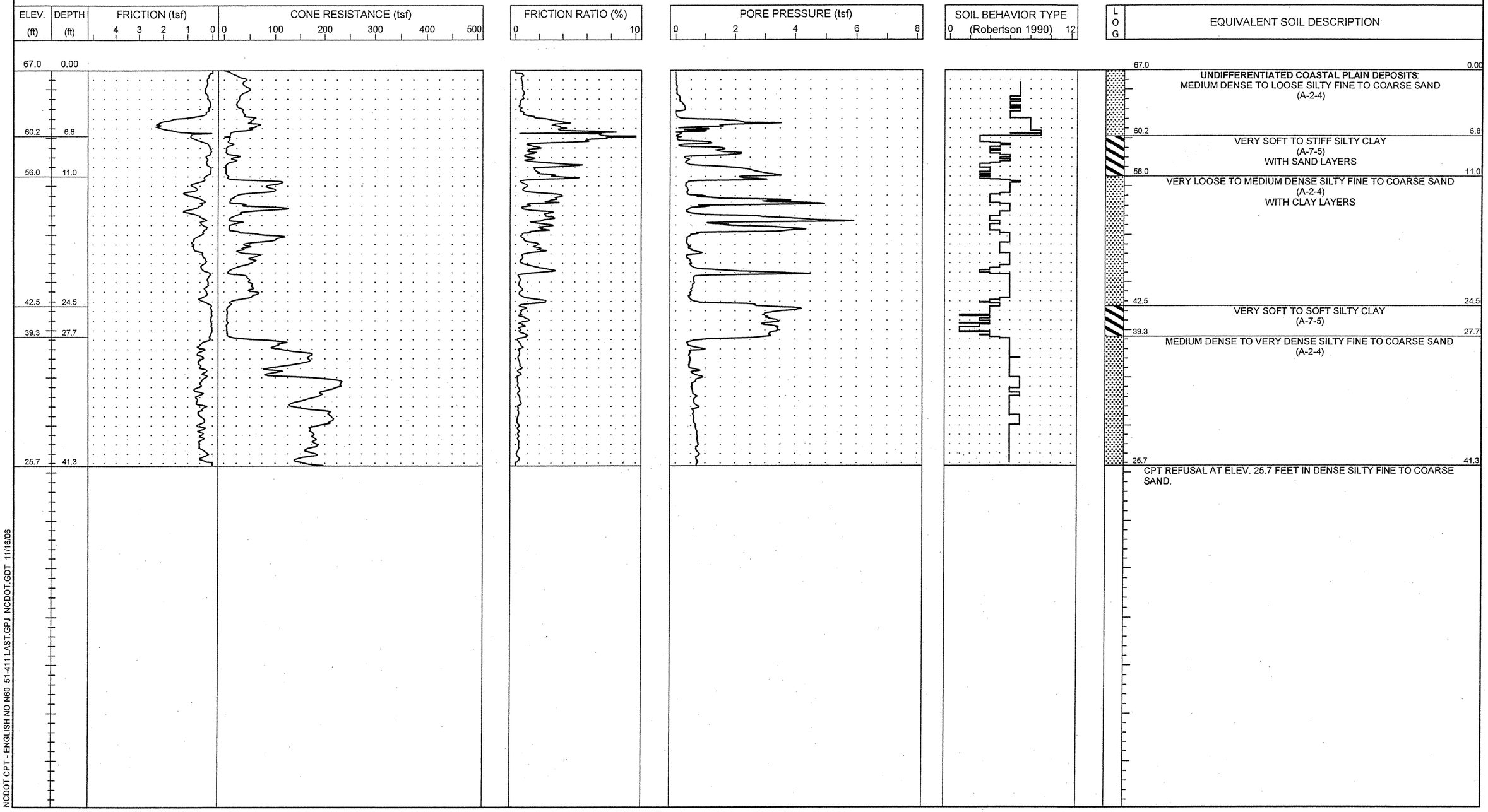
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 41.3 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 8A	**BORING LOCATION** 41+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 11/8/06	**COMPLETED** 11/8/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 67.0 ft	**NORTHING** 186,518.7	**EASTING** 2,278,008.7		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



EQUIVALENT SOIL DESCRIPTION

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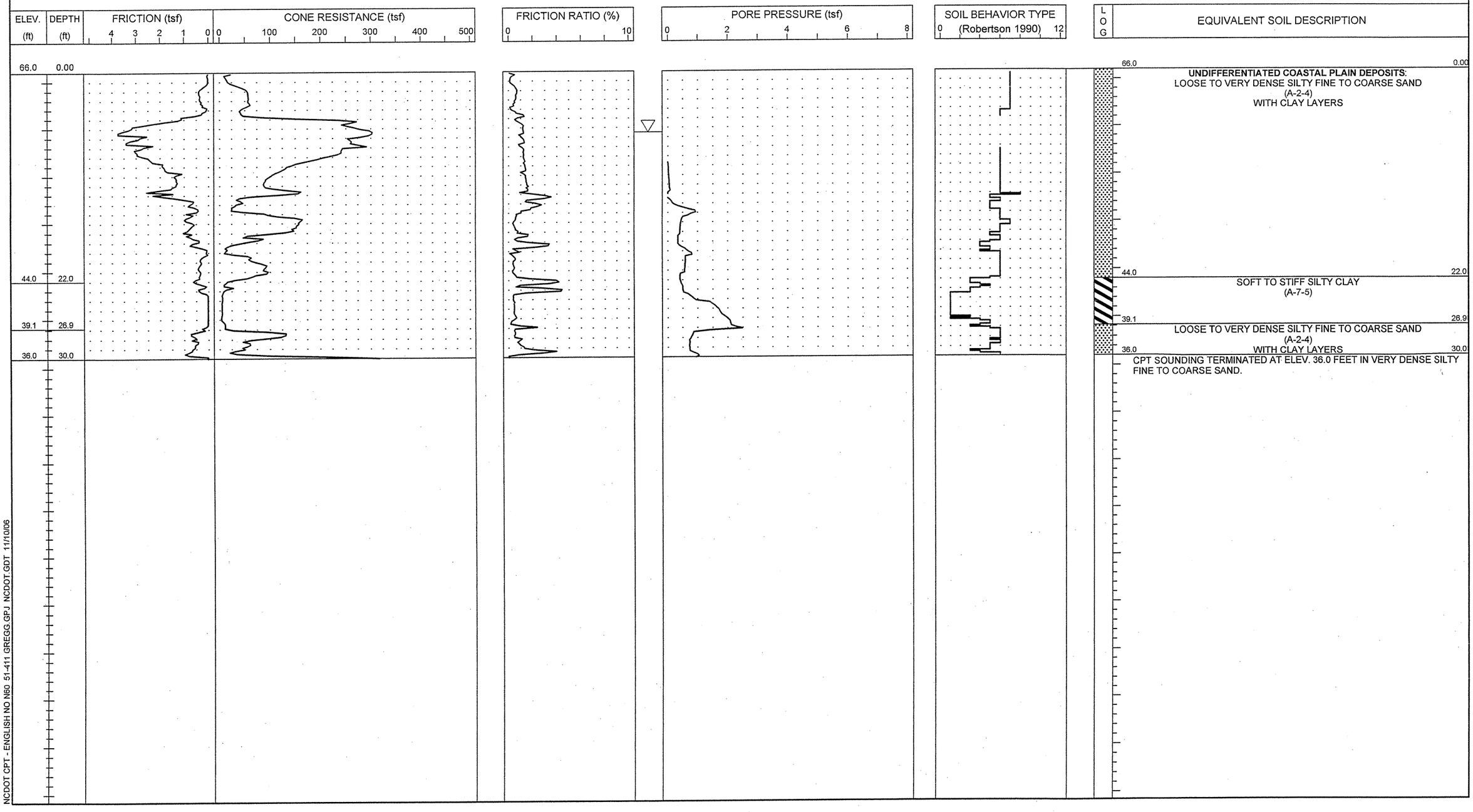
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 30.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-10	**BORING LOCATION** 45+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 6.5	**DATE STARTED** 10/20/06	**COMPLETED** 10/20/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 66.0 ft	**NORTHING** 186,918.6	**EASTING** 2,278,009.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



LOG

EQUIVALENT SOIL DESCRIPTION

66.0 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

44.0 — 22.0

SOFT TO STIFF SILTY CLAY
(A-7-5)

39.1 — 26.9

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

36.0 — 30.0

CPT SOUNDING TERMINATED AT ELEV. 36.0 FEET IN VERY DENSE SILTY FINE TO COARSE SAND.

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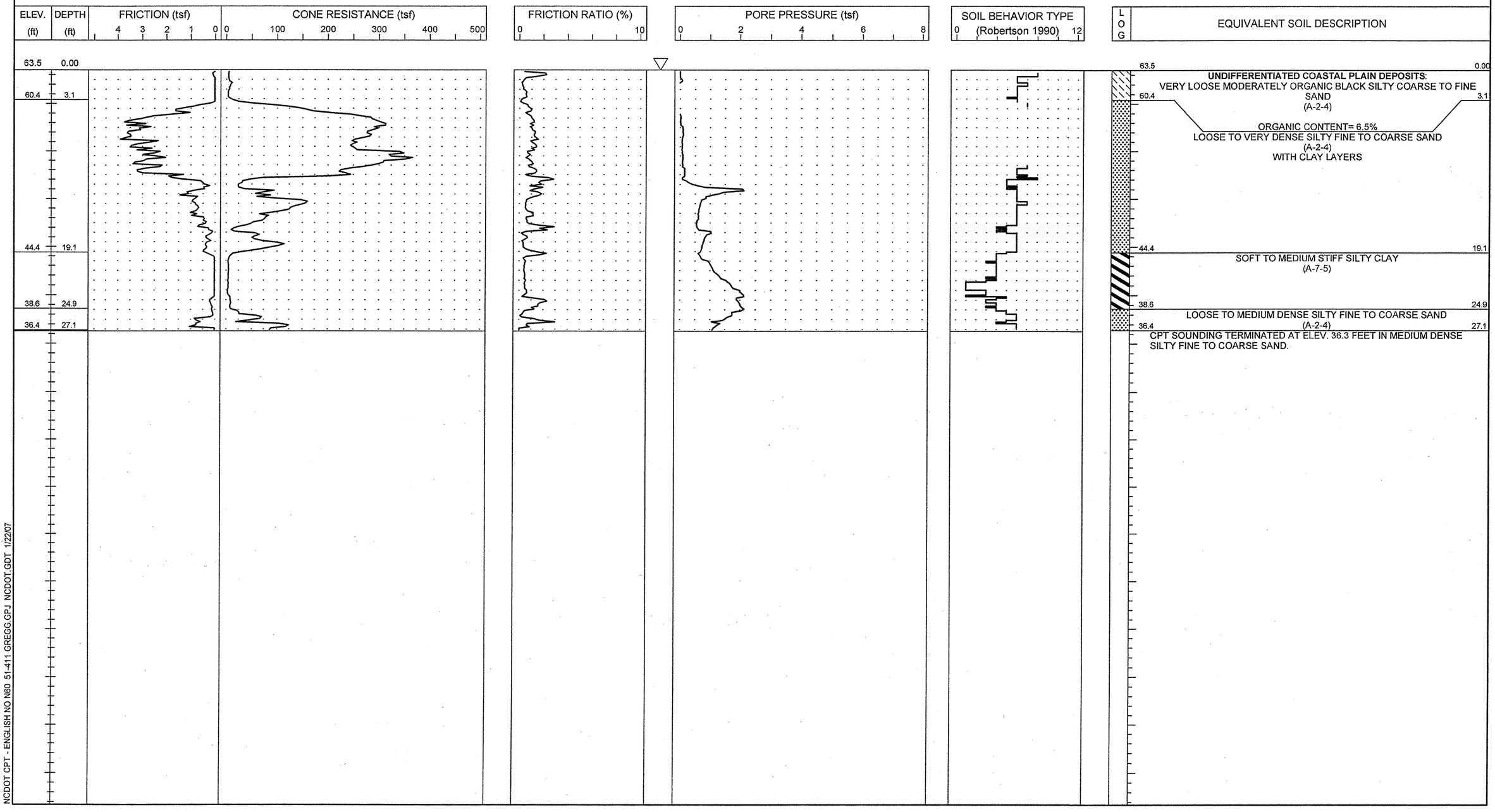
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 27.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-11	**BORING LOCATION** 47+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/20/06	**COMPLETED** 10/20/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 63.5 ft	**NORTHING** 187,118.5	**EASTING** 2,278,016.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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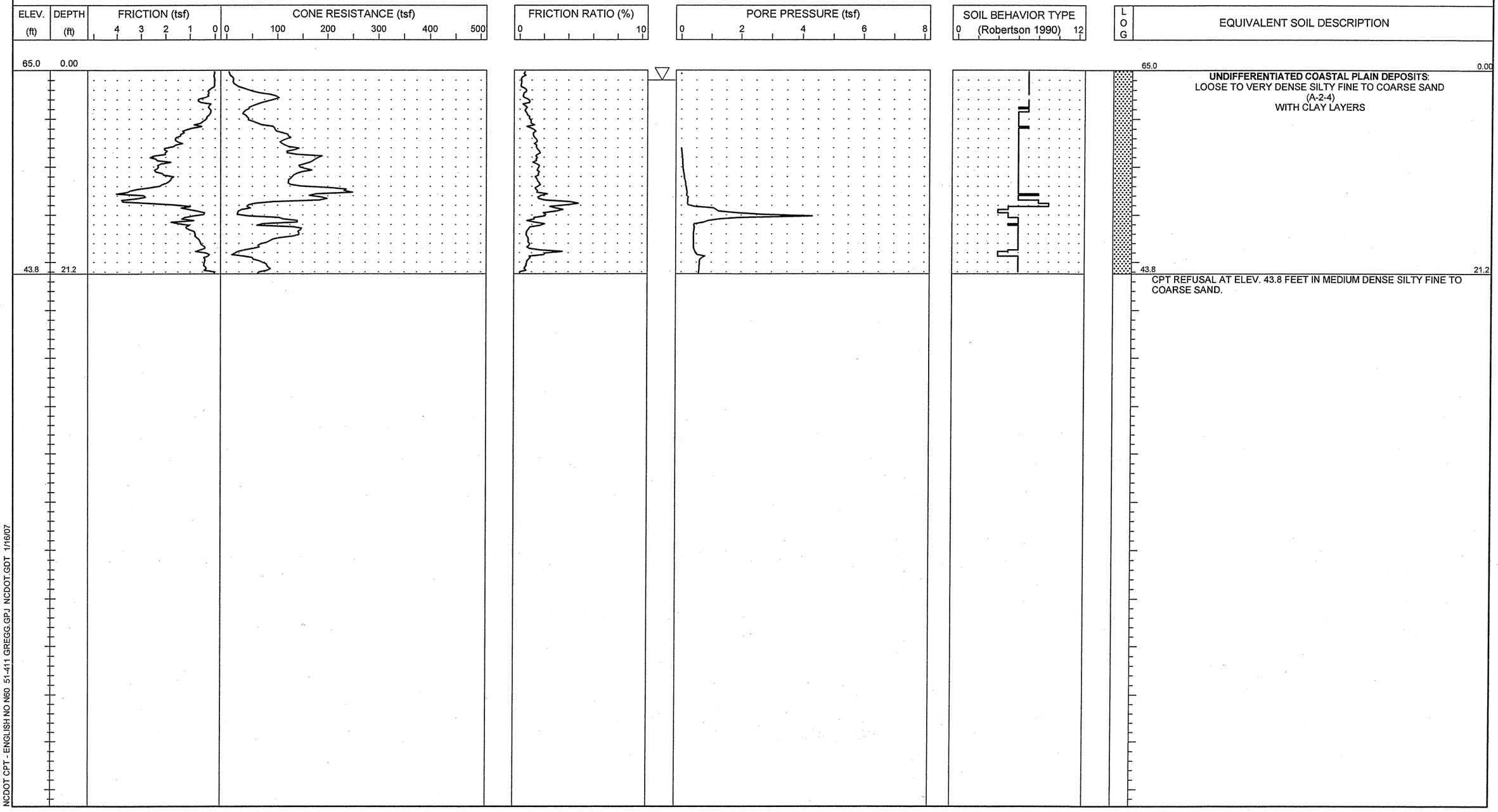
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 21.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-12	**BORING LOCATION** 49+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/20/06	**COMPLETED** 10/20/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 65.0 ft	**NORTHING** 187,318.2	**EASTING** 2,278,027.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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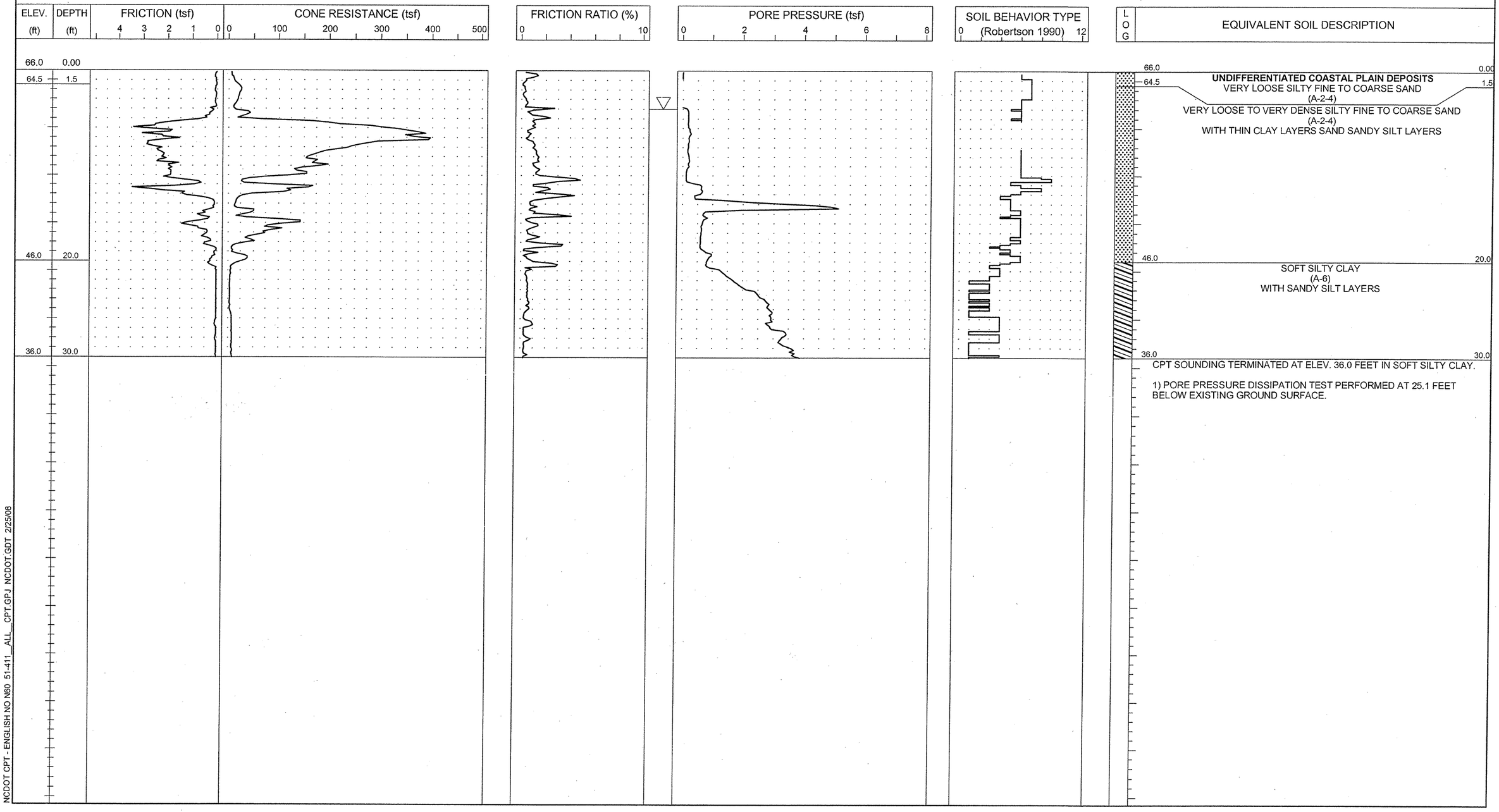
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 30.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 13	**BORING LOCATION** 51+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/20/06	**COMPLETED** 10/20/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 66.0 ft	**NORTHING** 187,517.7	**EASTING** 2,278,041.8		**24 HR.** N/M	**DRILLER:** R. Schubert	**TECHNICIAN** K. Canuel	



NCDOT CPT - ENGLISH NO N60 51-411__ALL__CPT.GPJ NCDOT.GDT 2/25/08

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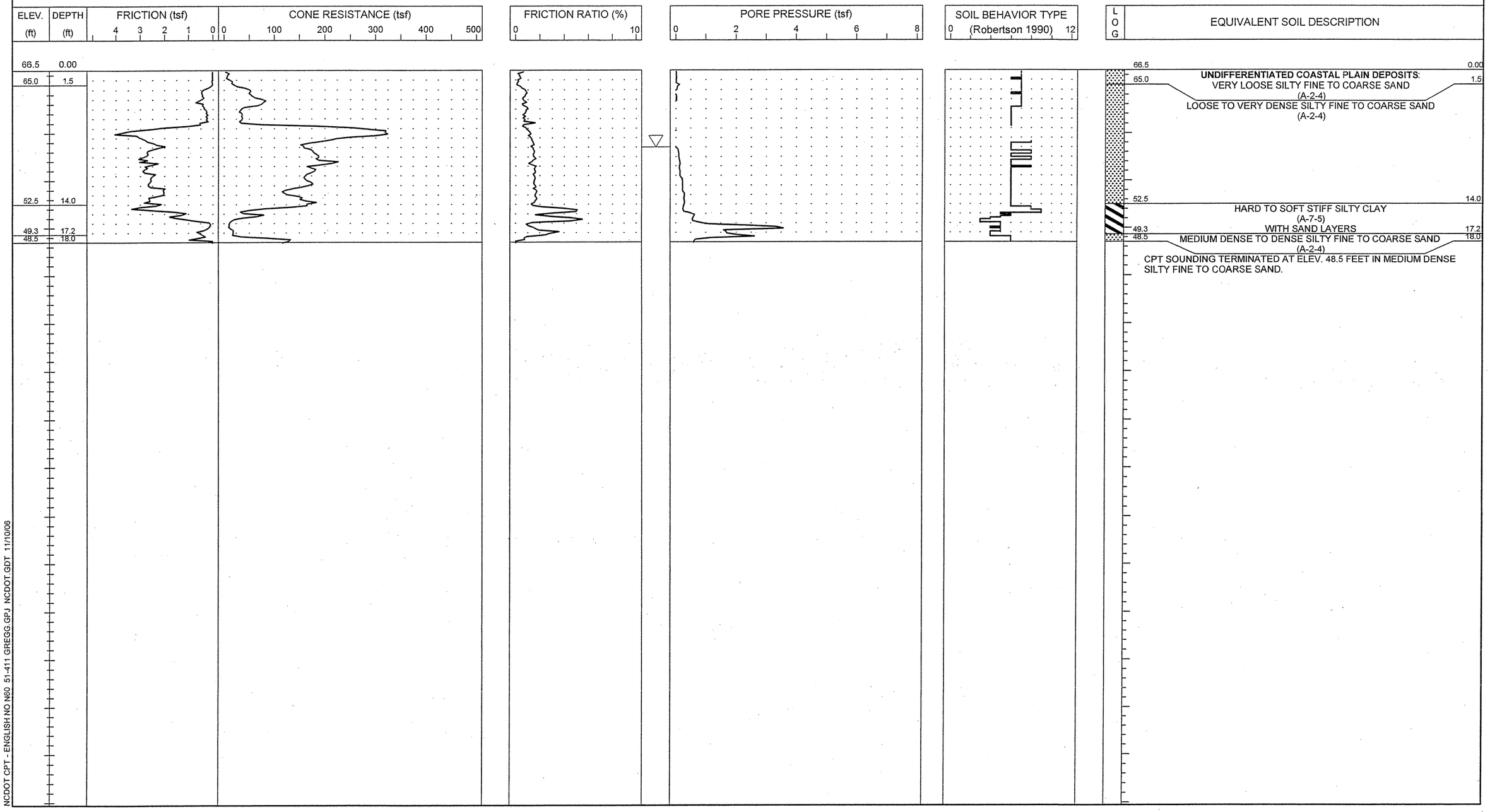
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-14	**BORING LOCATION** 53+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/19/06	**COMPLETED** 10/19/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 66.5 ft	**NORTHING** 187,716.8	**EASTING** 2,278,060.5		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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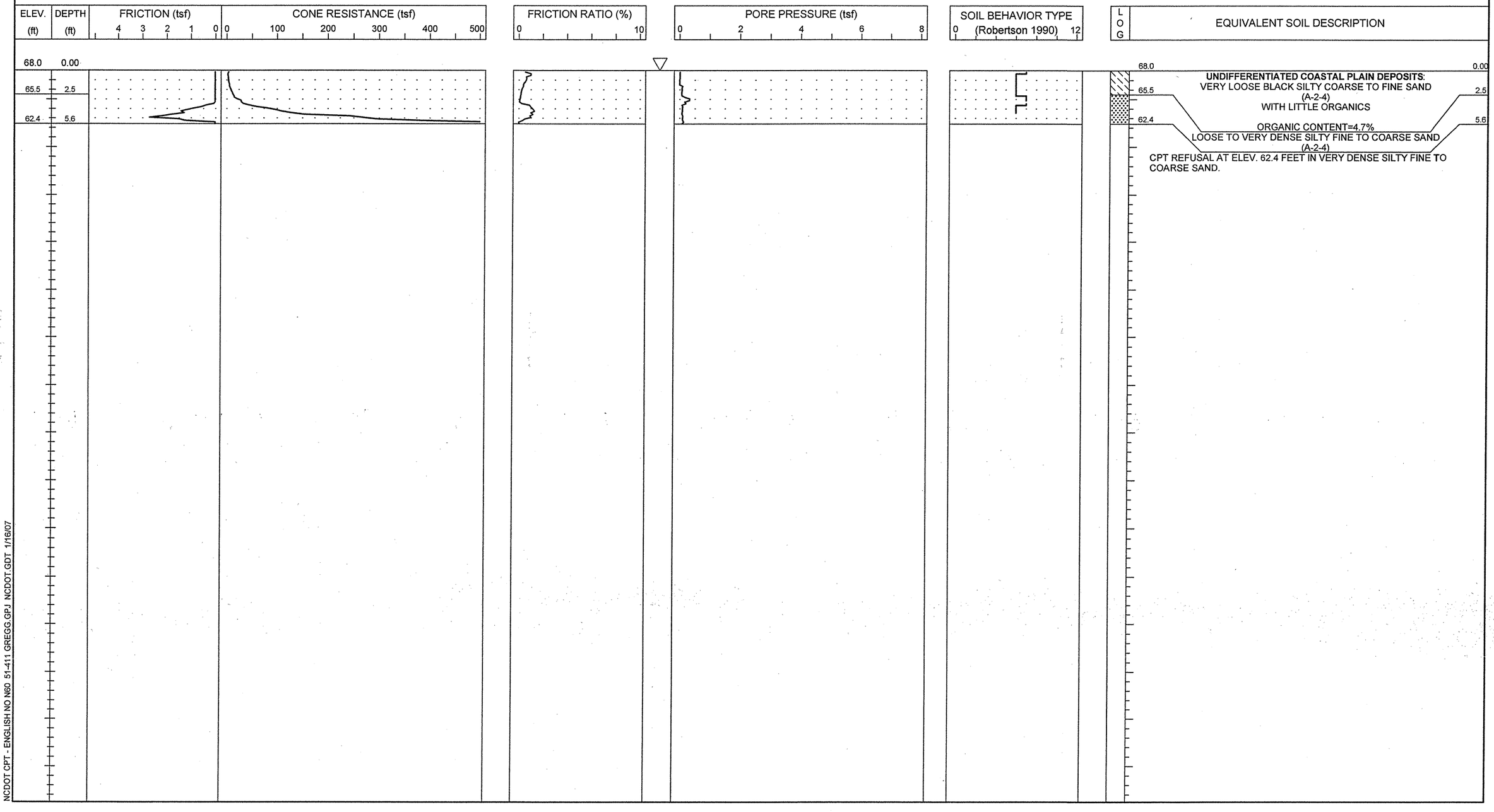
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 5.6 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-15	**BORING LOCATION** 55+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/19/06	**COMPLETED** 10/19/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 68.0 ft	**NORTHING** 187,915.5	**EASTING** 2,278,083.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



NCDOT CPT - ENGLISH NO N60 51-411 GREGG.GPJ NCDOT.GDT 1/16/07

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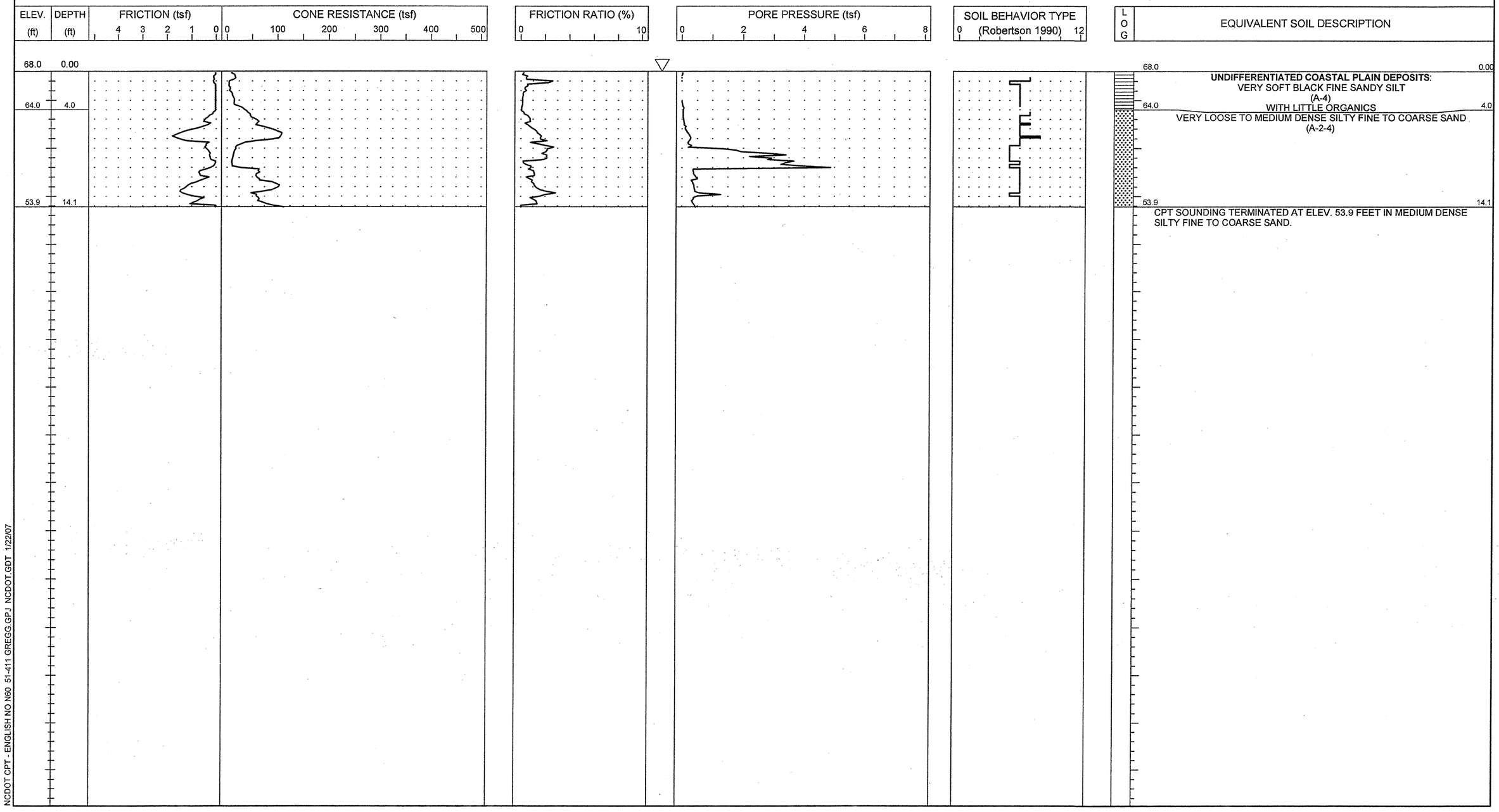
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-16	**BORING LOCATION** 57+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/21/06	**COMPLETED** 10/21/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 68.0 ft	**NORTHING** 188,113.7	**EASTING** 2,278,110.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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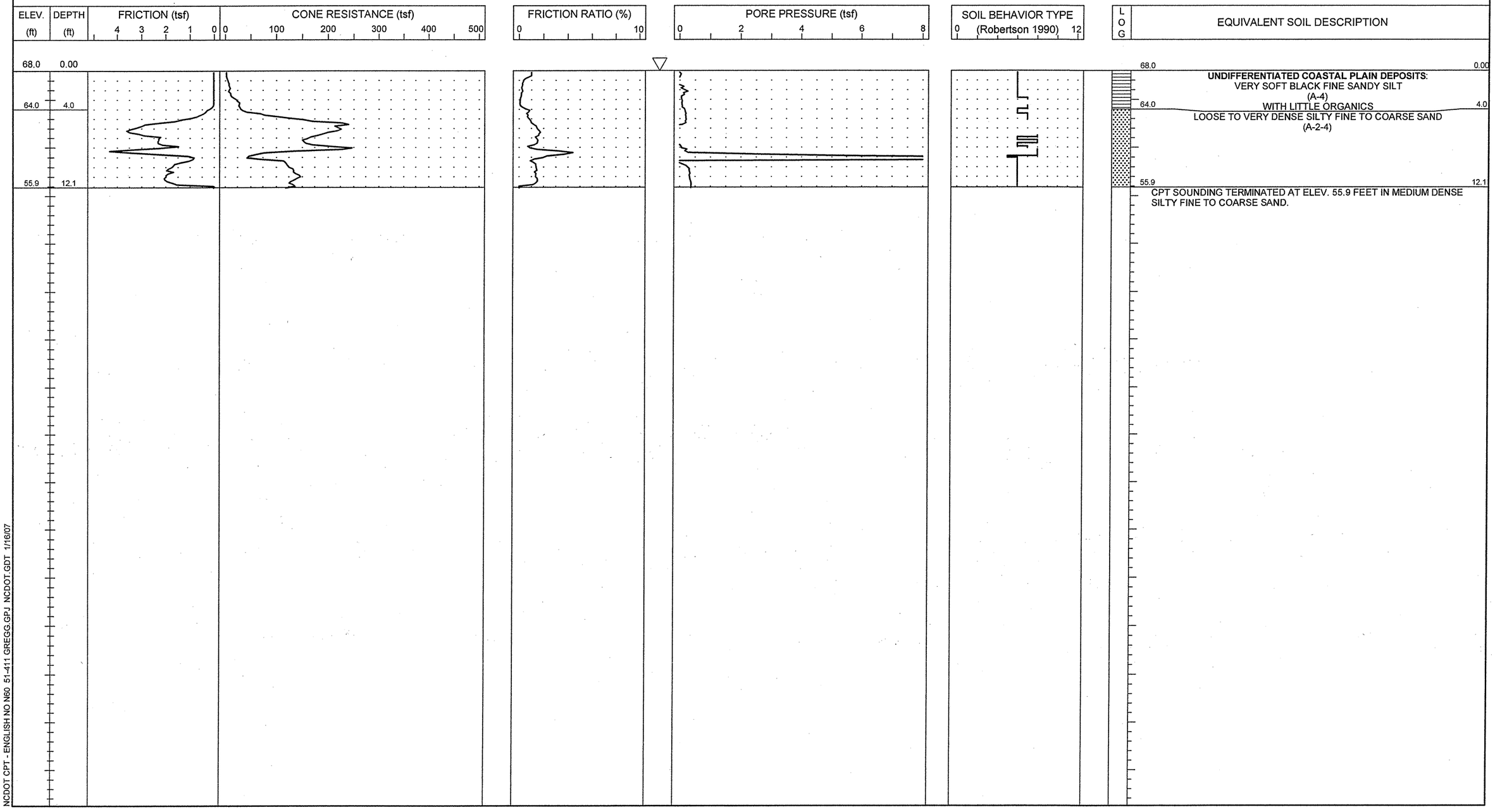
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 12.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-17	**BORING LOCATION** 59+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/21/06	**COMPLETED** 10/21/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 68.0 ft	**NORTHING** 188,311.3	**EASTING** 2,278,141.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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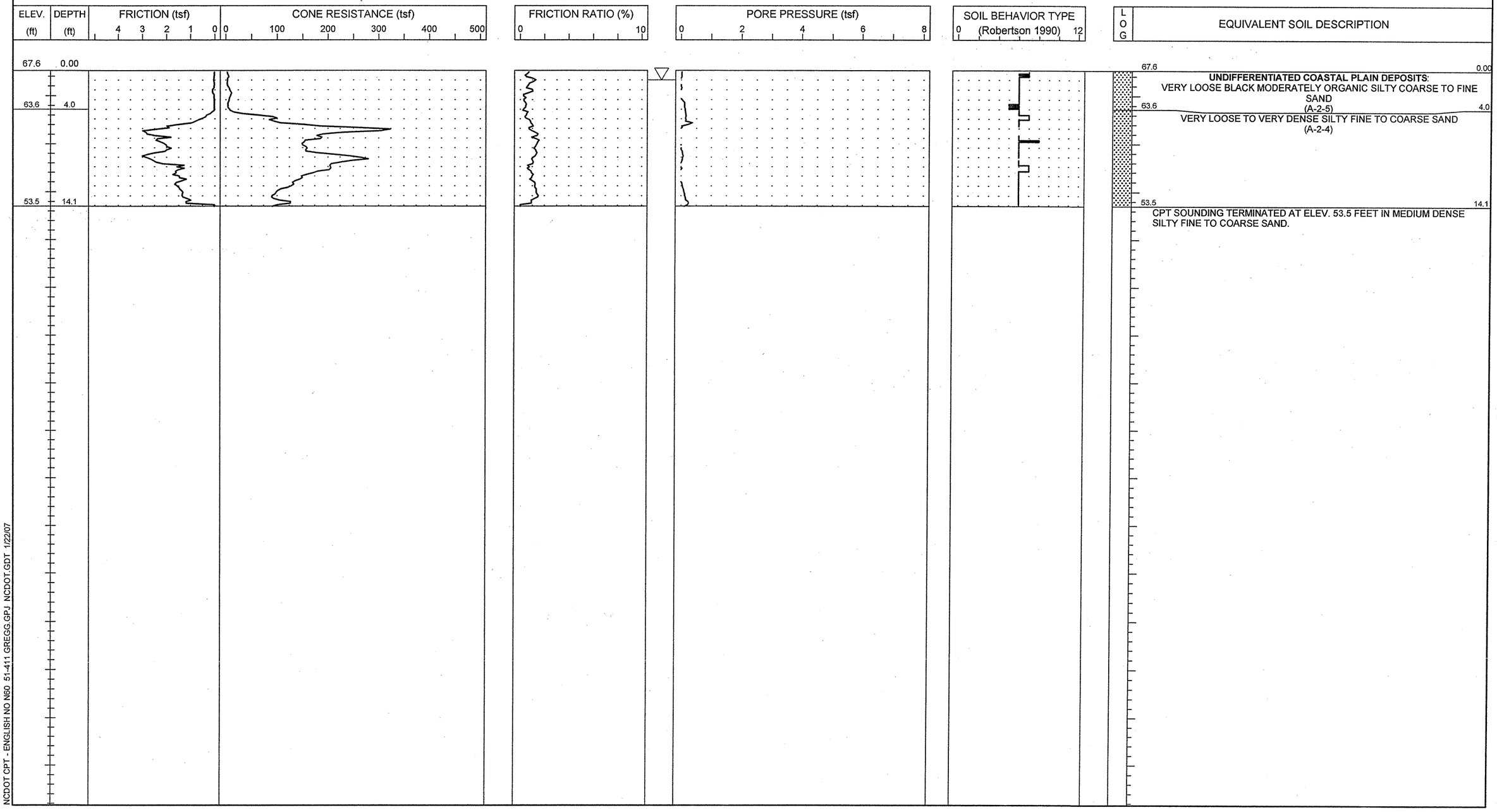
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-18	**BORING LOCATION** 61+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 67.6 ft	**NORTHING** 188,508.2	**EASTING** 2,278,175.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60_51-411 GREGG.GPJ_NCDOT.GDT 1/22/07

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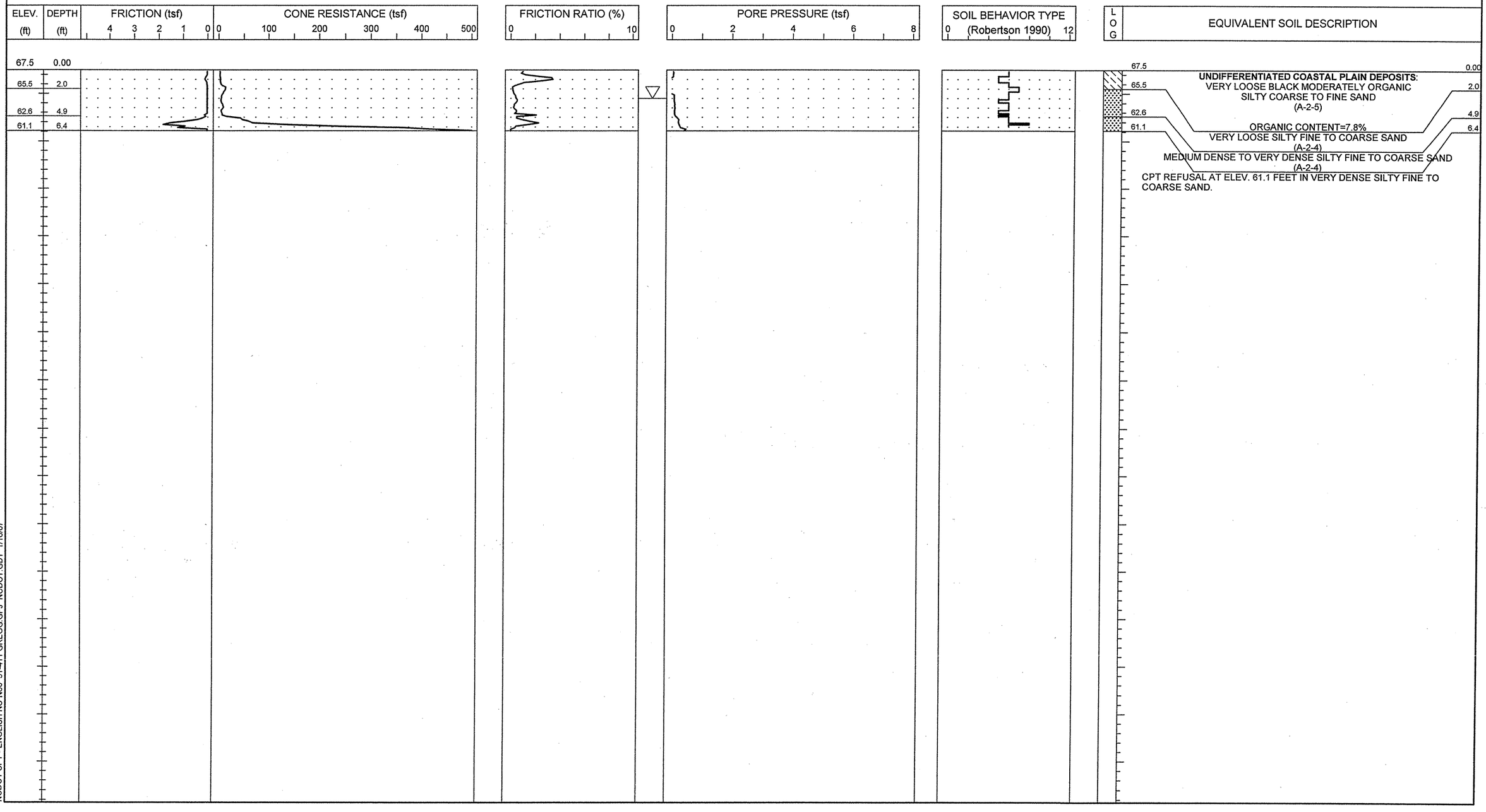
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 6.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-19	**BORING LOCATION** 63+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 67.5 ft	**NORTHING** 188,704.4	**EASTING** 2,278,214.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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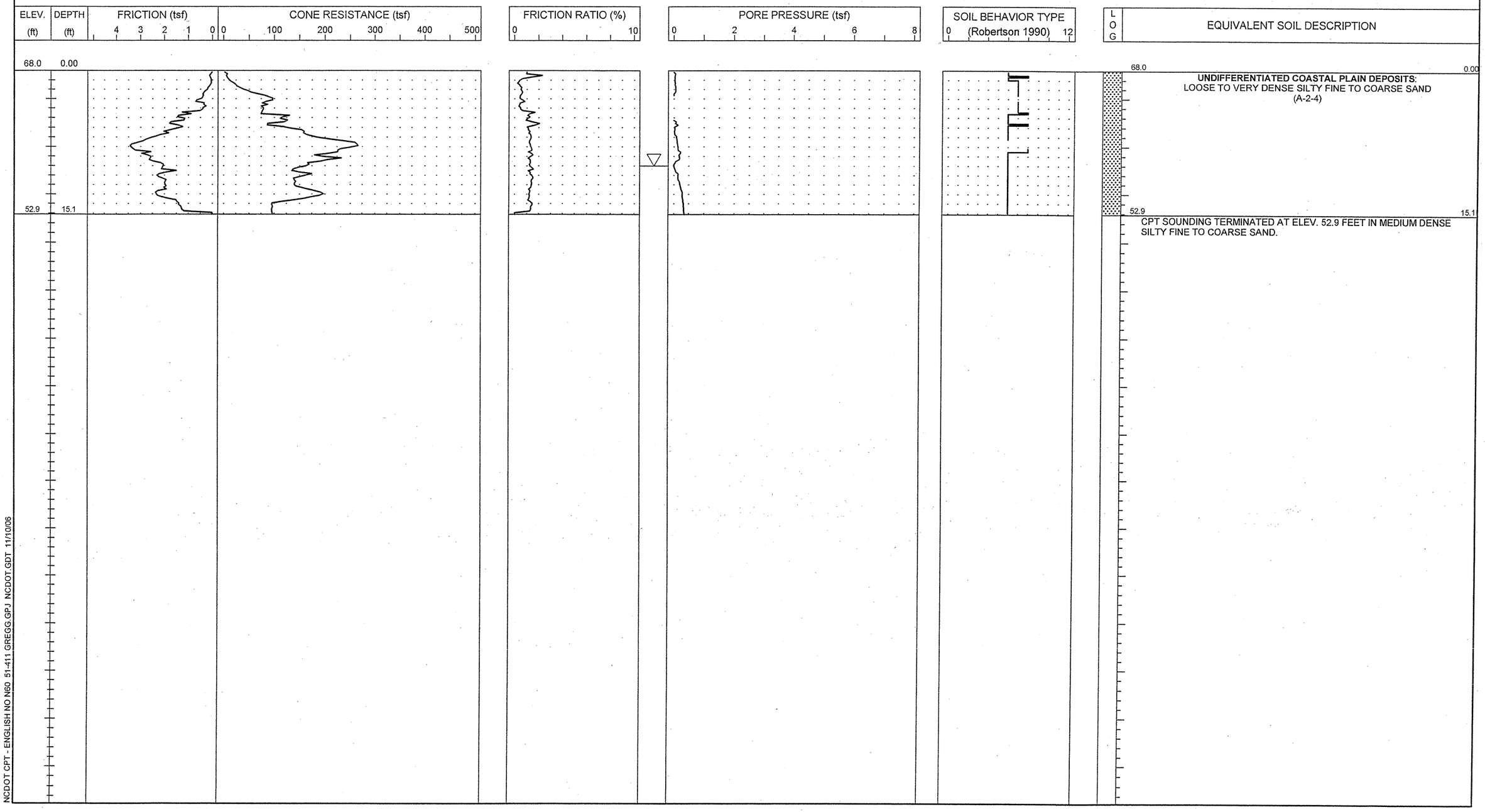
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-20	**BORING LOCATION** 65+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 10.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 68.0 ft	**NORTHING** 188,899.8	**EASTING** 2,278,257.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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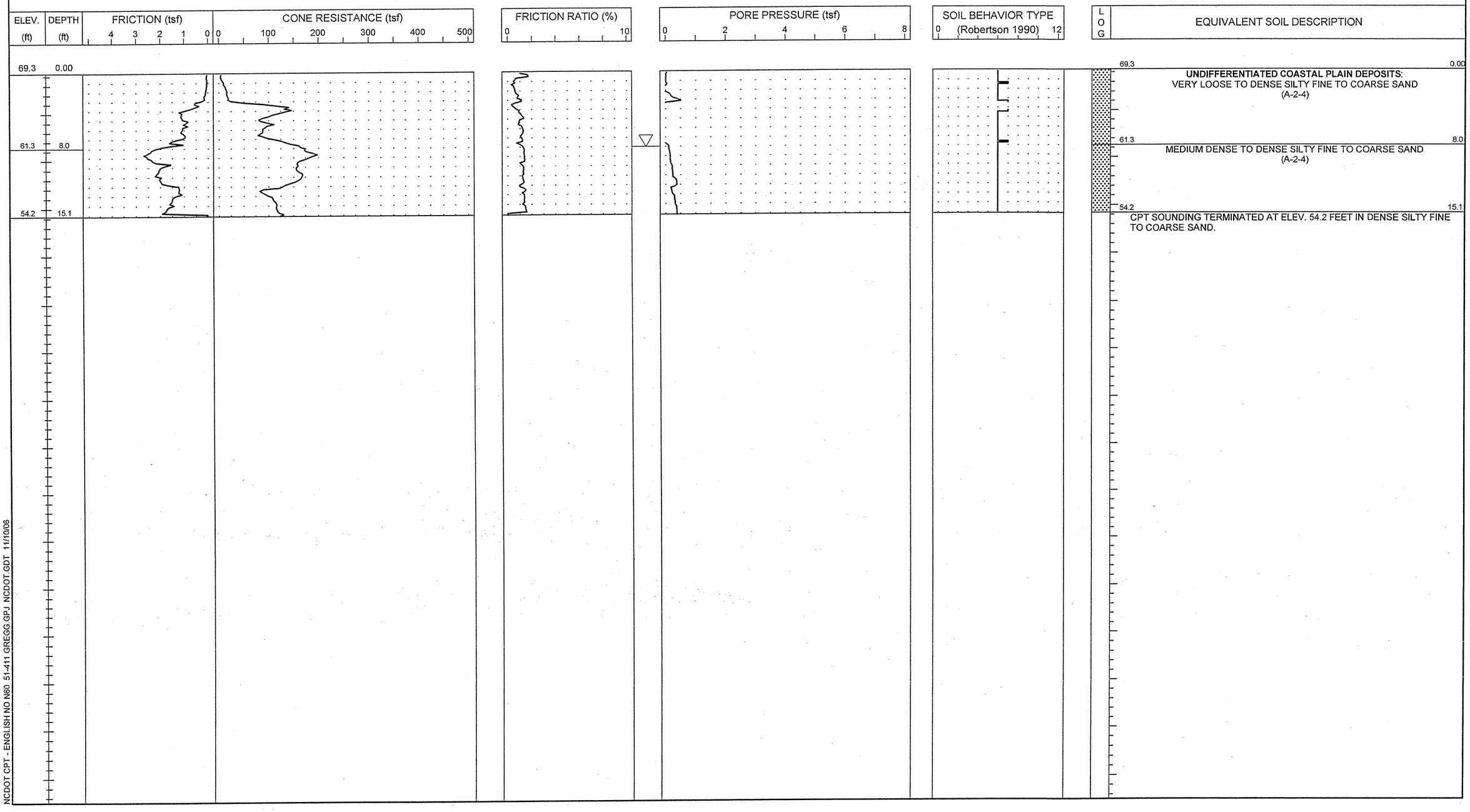
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-21	**BORING LOCATION** 67+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 69.3 ft	**NORTHING** 189,094.2	**EASTING** 2,278,304.4	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN		



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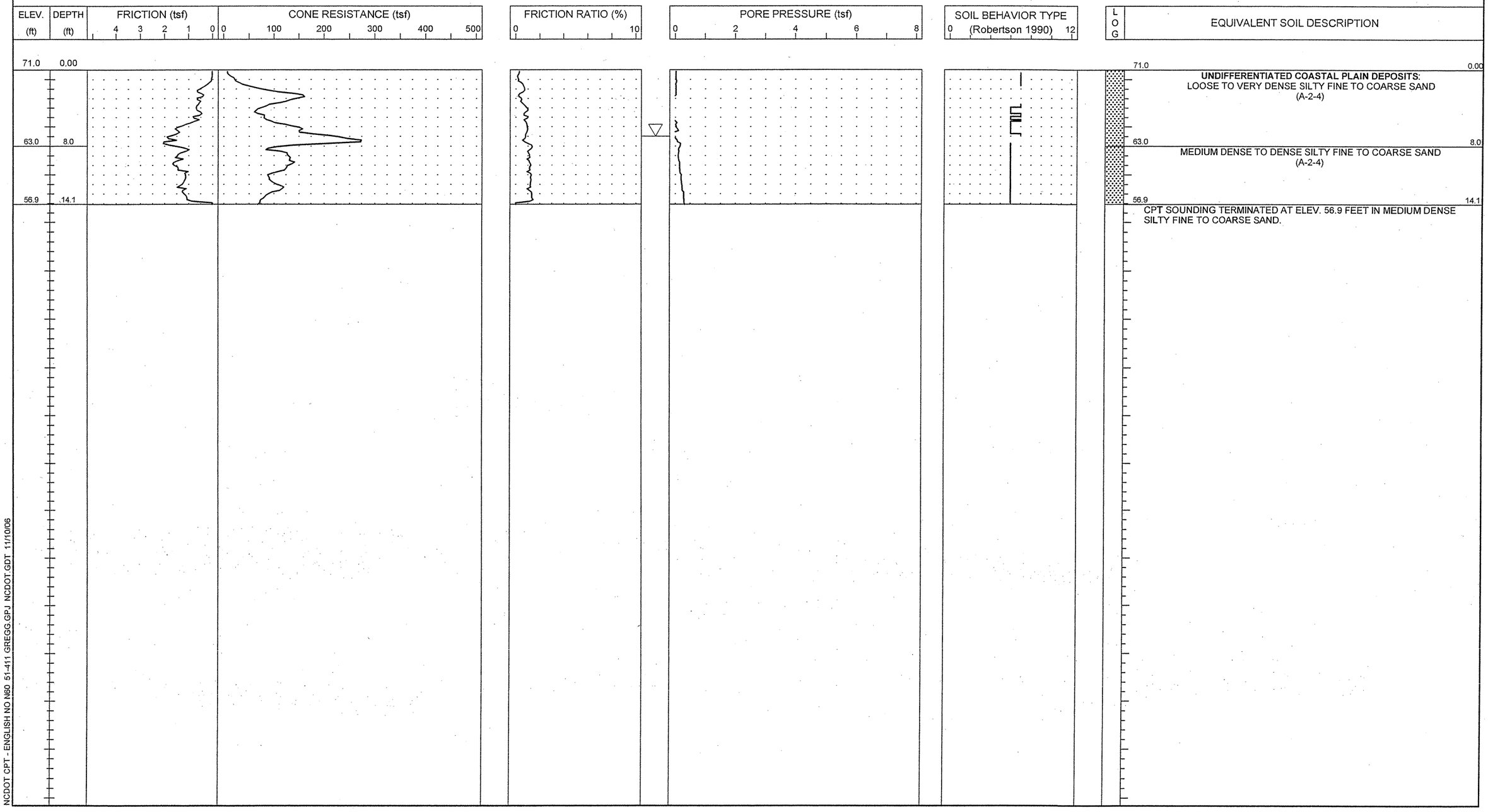
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-22	**BORING LOCATION** 69+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 71.0 ft	**NORTHING** 189,287.7	**EASTING** 2,278,355.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



EQUIVALENT SOIL DESCRIPTION

71.0 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)

63.0 — 8.0

MEDIUM DENSE TO DENSE SILTY FINE TO COARSE SAND
(A-2-4)

56.9 — 14.1

CPT SOUNDING TERMINATED AT ELEV. 56.9 FEET IN MEDIUM DENSE SILTY FINE TO COARSE SAND.

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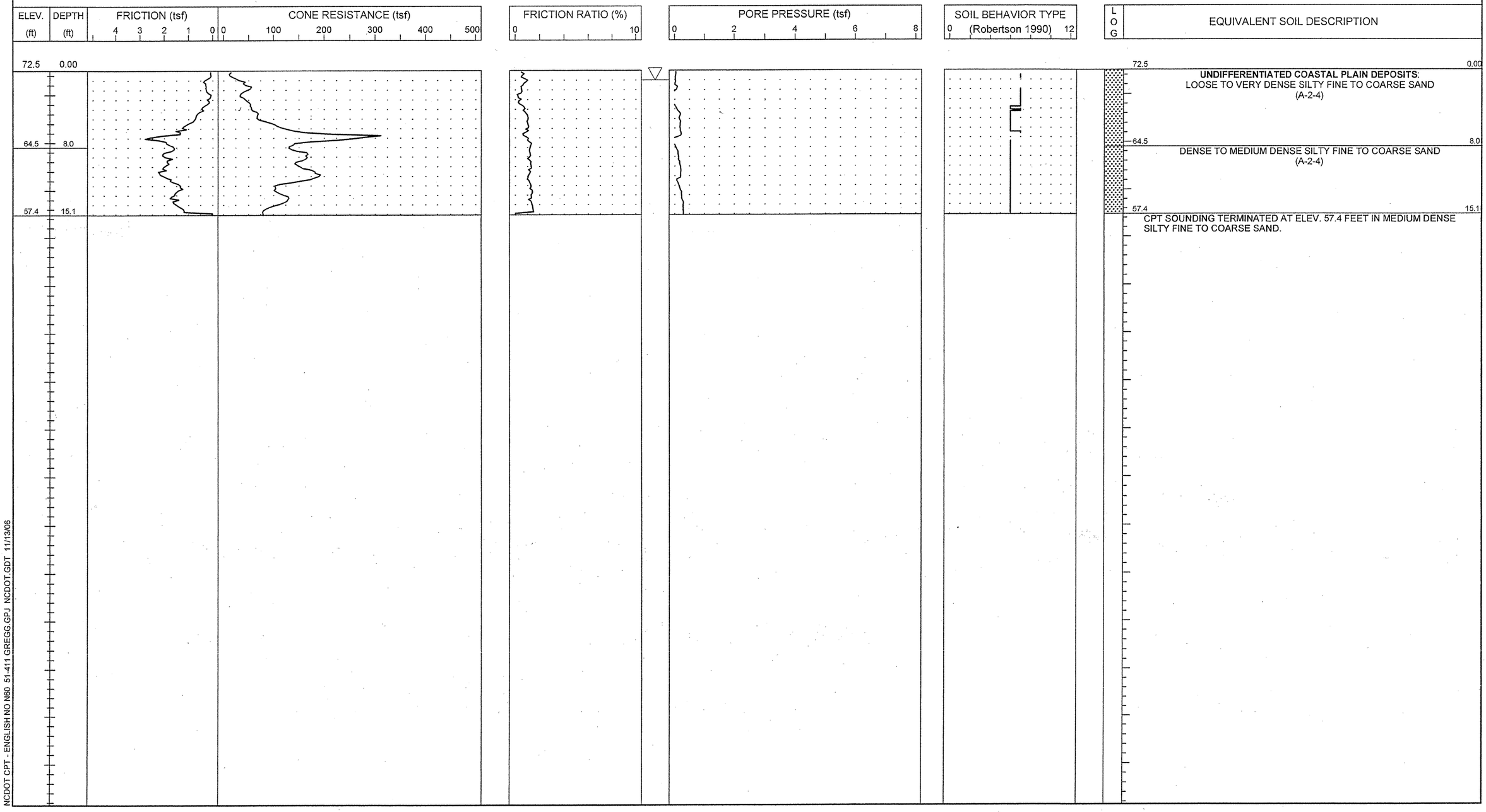
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-23	**BORING LOCATION** 71+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 72.5 ft	**NORTHING** 189,480.1	**EASTING** 2,278,409.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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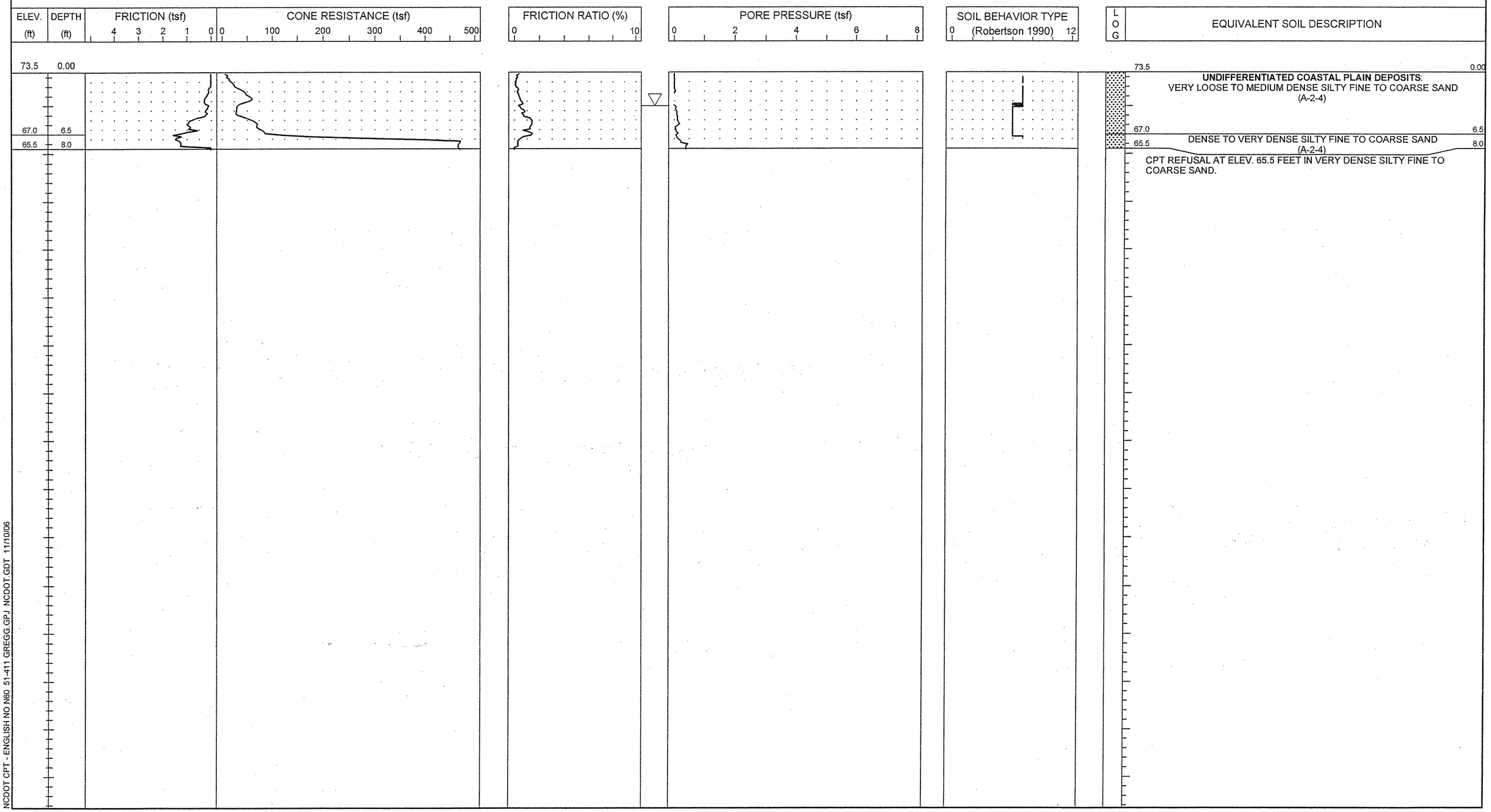
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 8.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-24	**BORING LOCATION** 73+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.5	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 73.5 ft	**NORTHING** 189,671.3	**EASTING** 2,278,468.3		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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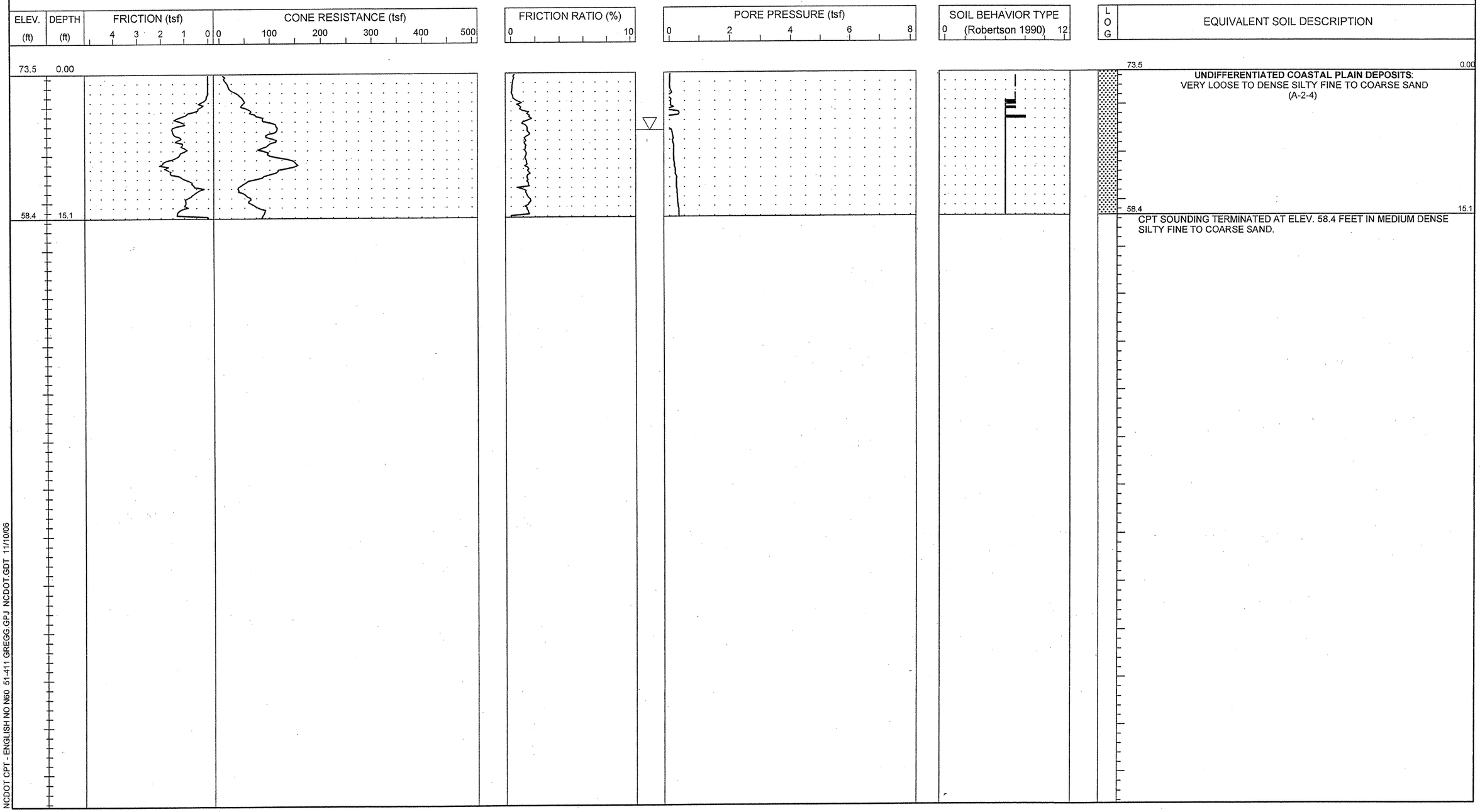
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-25	**BORING LOCATION** 75+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 6.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 73.5 ft	**NORTHING** 189,861.3	**EASTING** 2,278,530.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



NCDOT CPT - ENGLISH NO N60 51-411 GREGG.GPJ NCDOT.GDT 11/10/06

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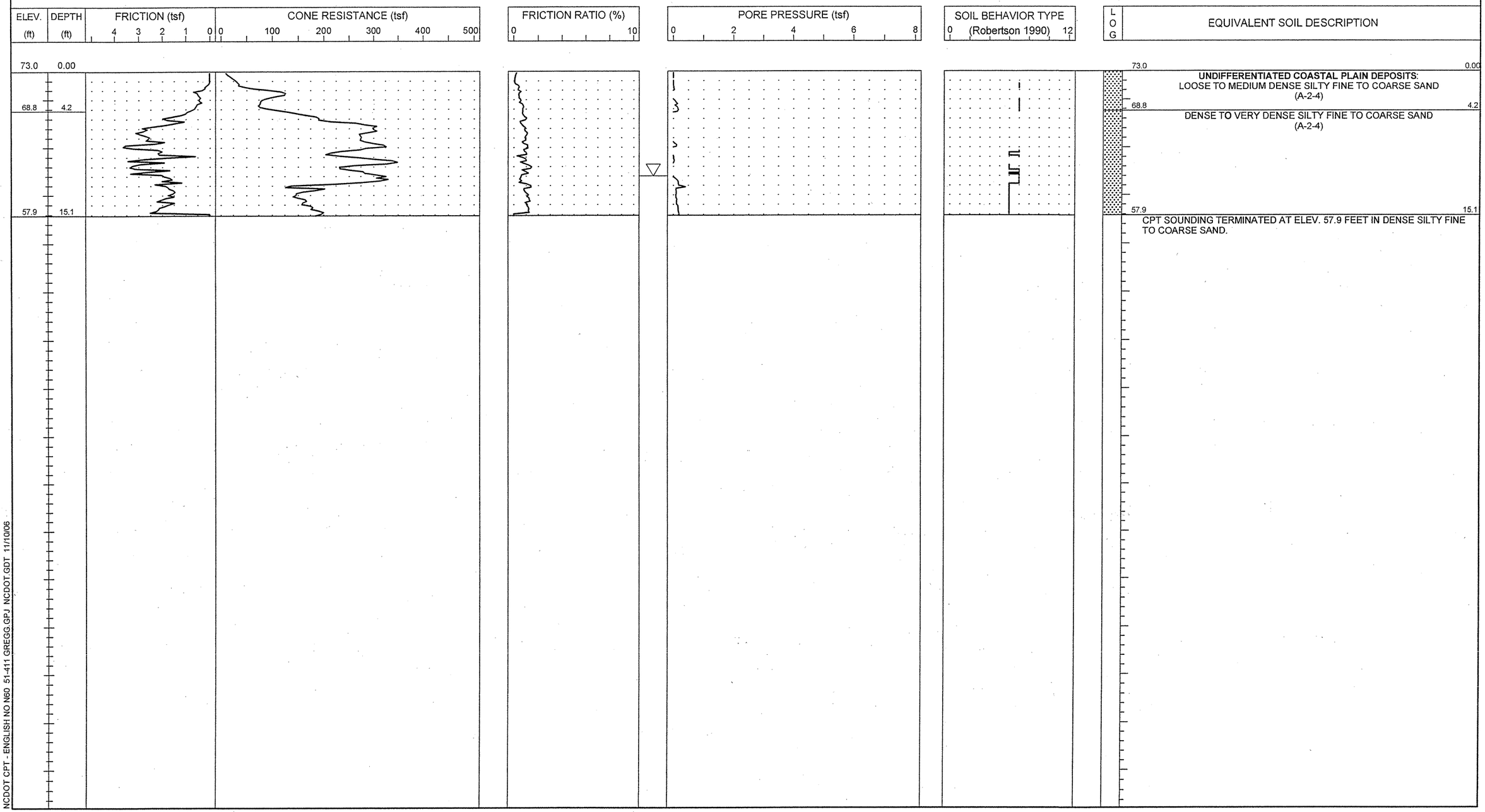
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-26	**BORING LOCATION** 77+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 11.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 73.0 ft	**NORTHING** 190,050.0	**EASTING** 2,278,596.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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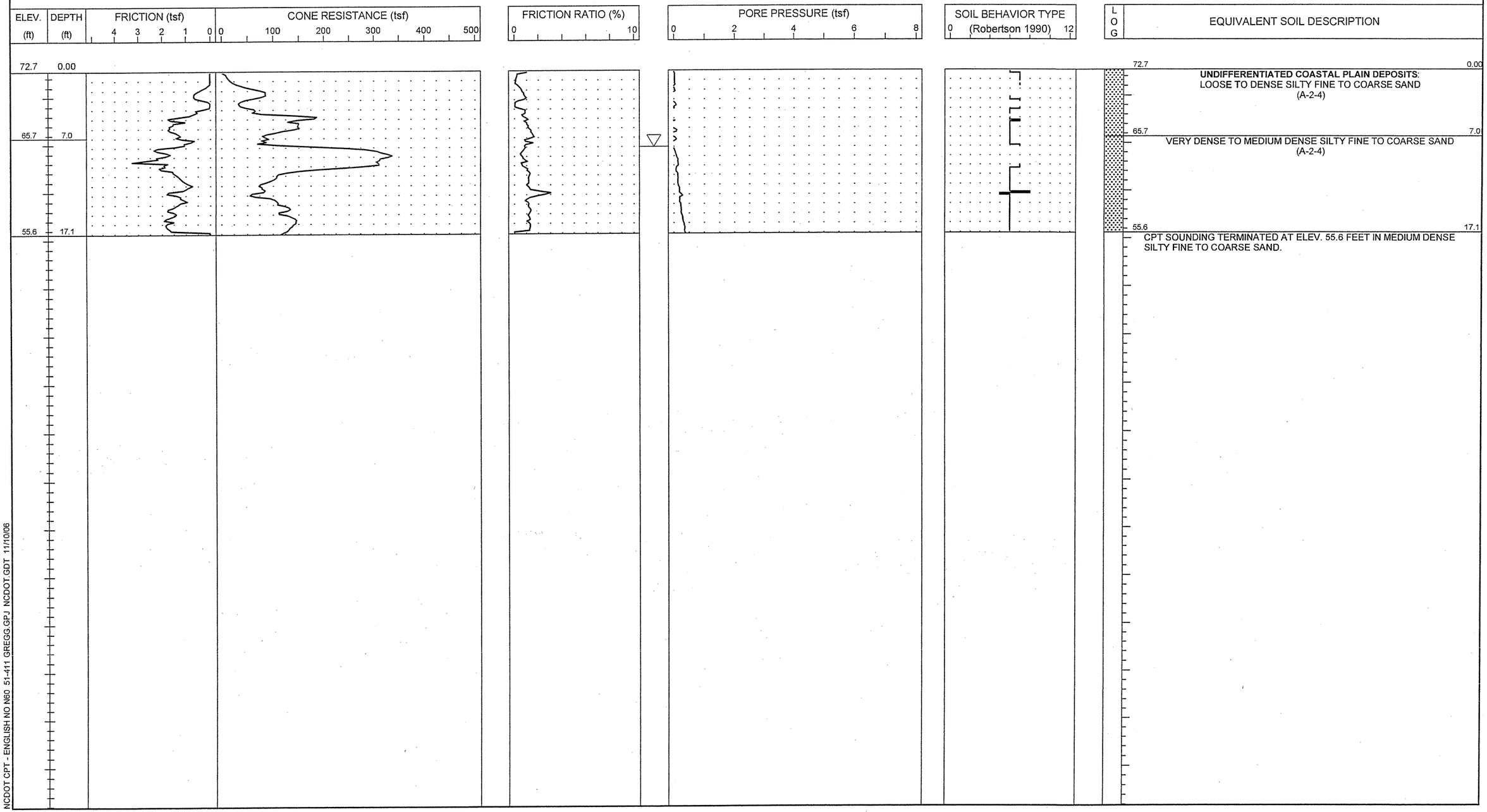
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-27	**BORING LOCATION** 79+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 72.7 ft	**NORTHING** 190,237.3	**EASTING** 2,278,667.0	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN		



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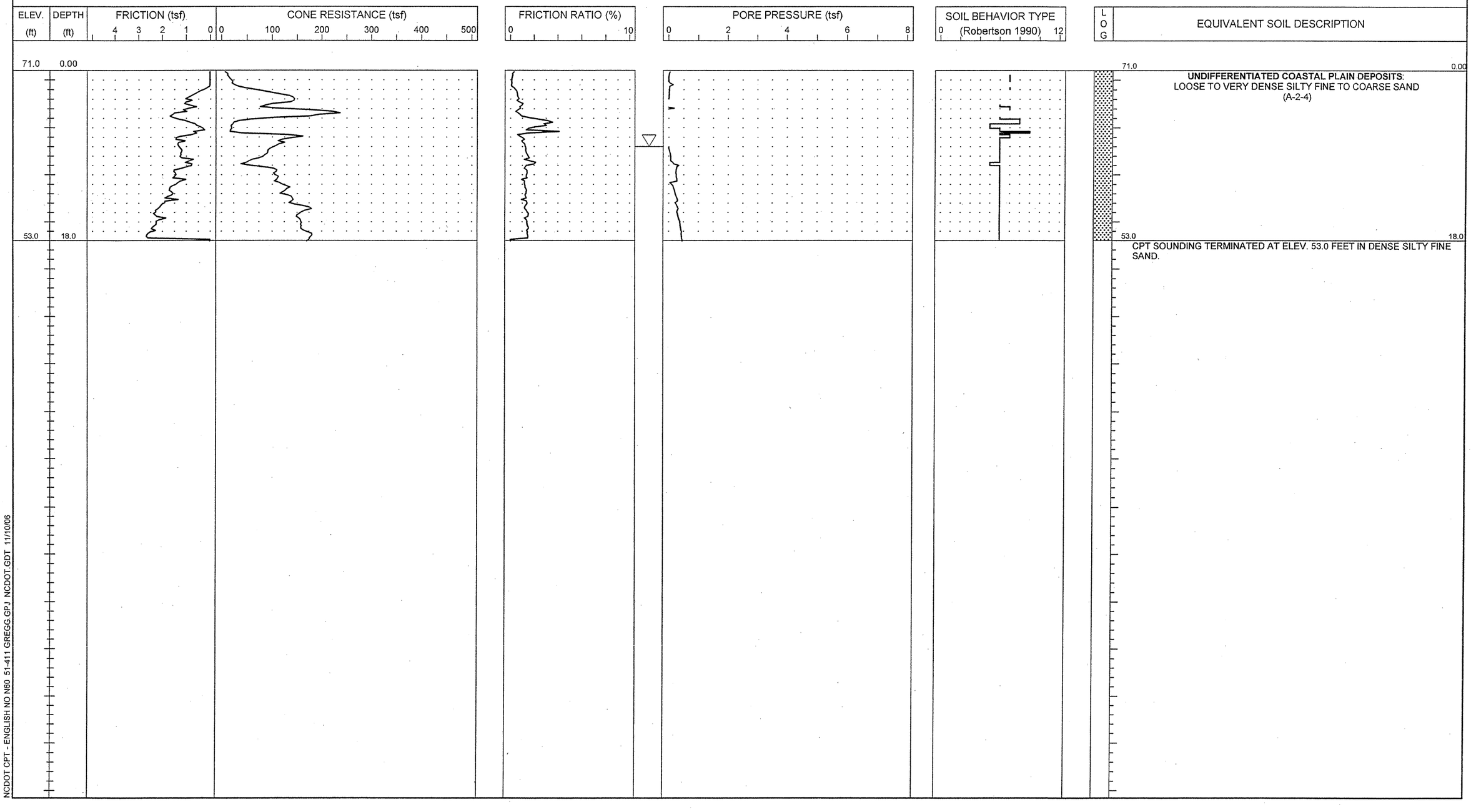
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-28	**BORING LOCATION** 81+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 71.0 ft	**NORTHING** 190,423.2	**EASTING** 2,278,740.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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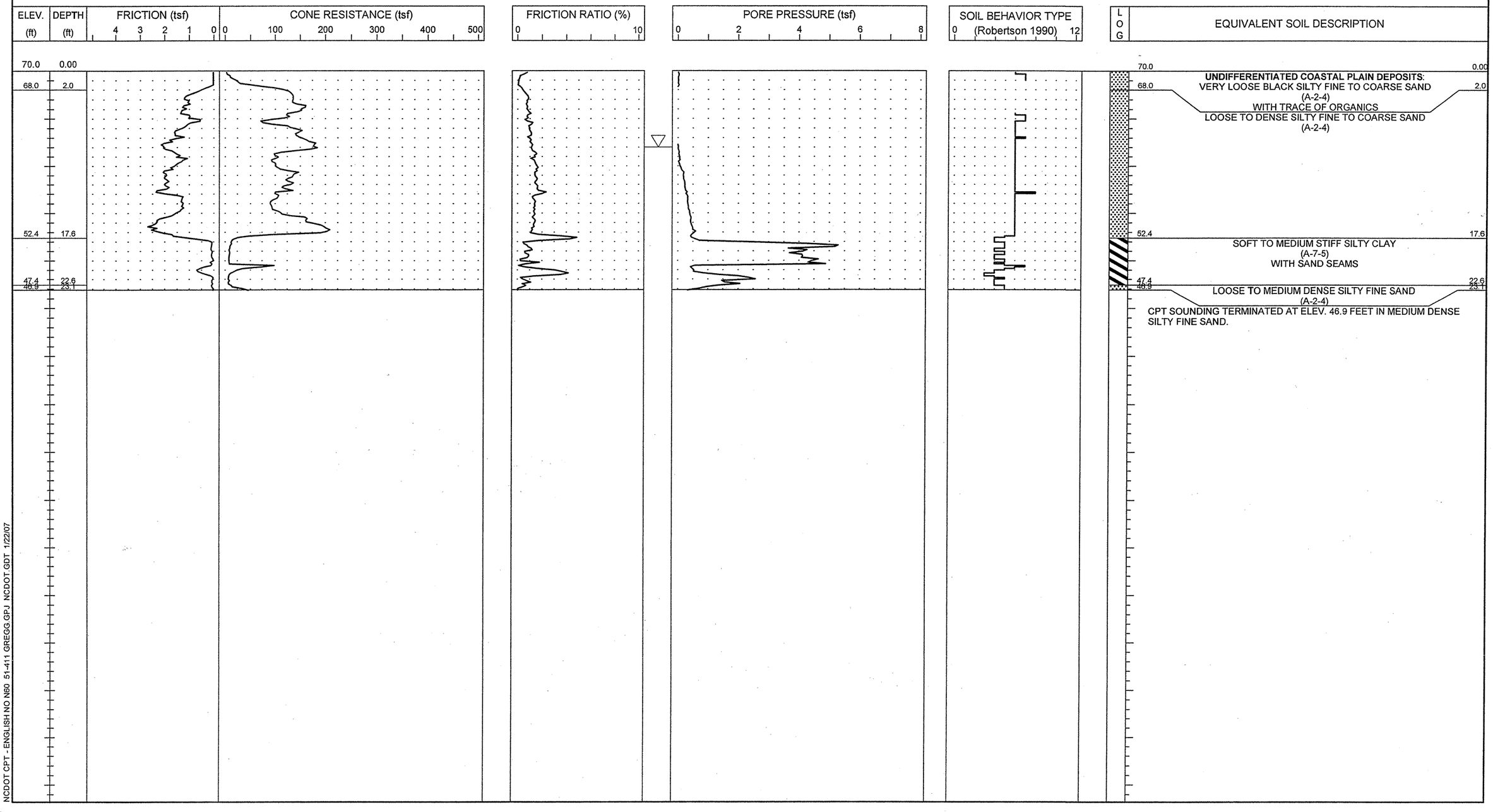
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 23.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-29	**BORING LOCATION** 83+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 70.0 ft	**NORTHING** 190,607.5	**EASTING** 2,278,818.5		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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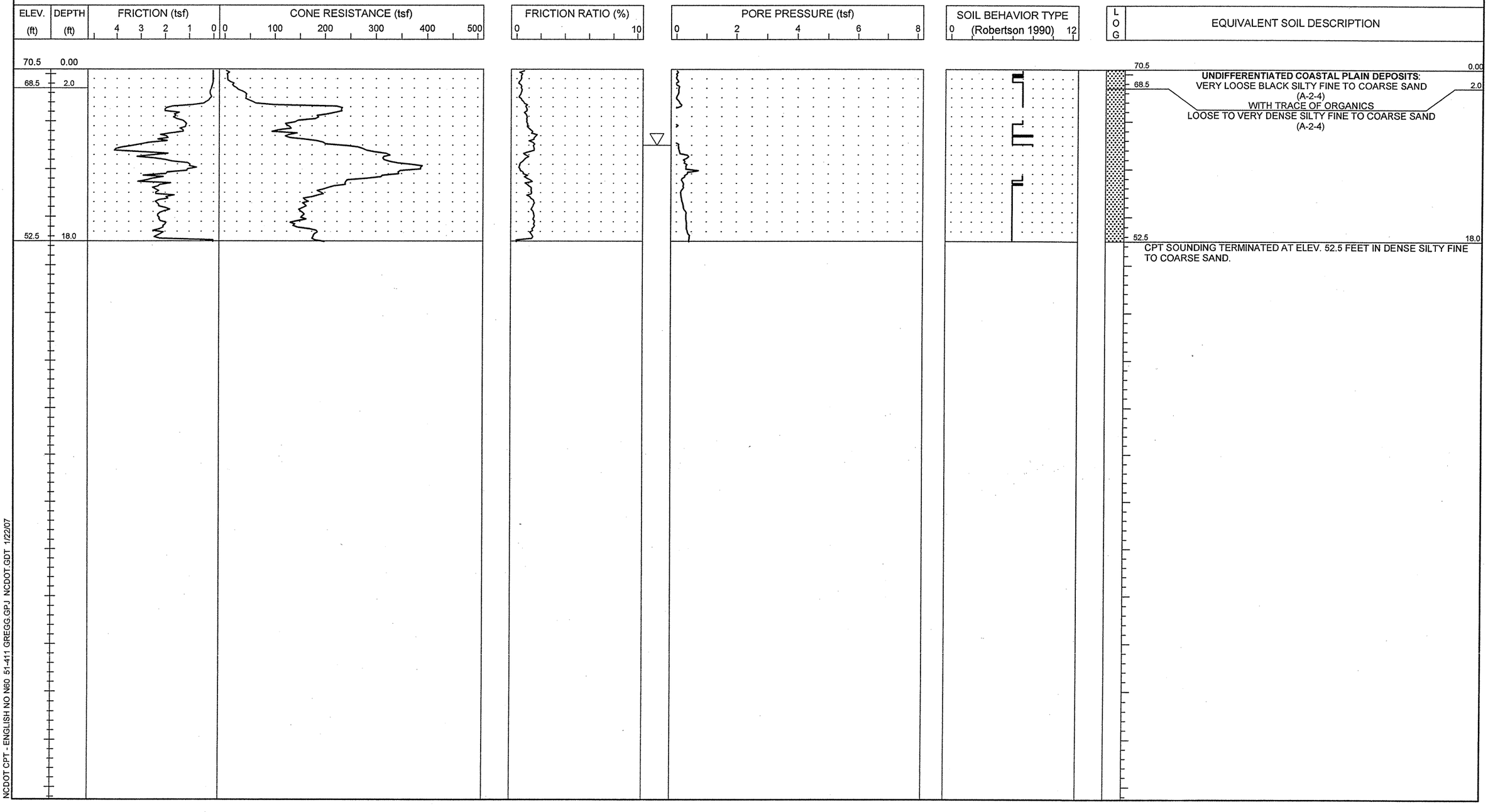
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-30	**BORING LOCATION** 85+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 70.5 ft	**NORTHING** 190,790.2	**EASTING** 2,278,900.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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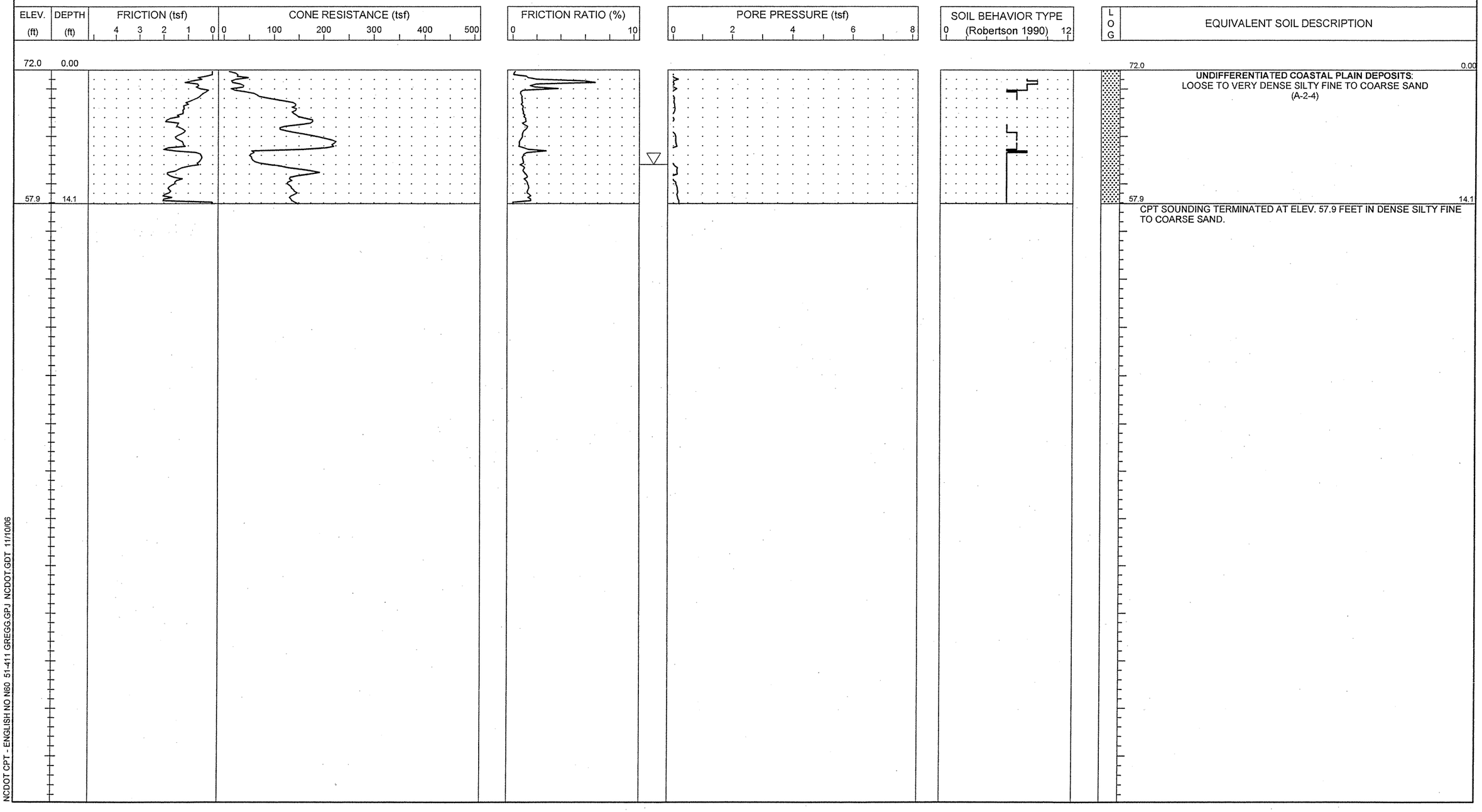
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-31	**BORING LOCATION** 87+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 10.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 72.0 ft	**NORTHING** 190,970.4	**EASTING** 2,278,986.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



NCDOT CPT - ENGLISH NO N60 51-411 GREGG.GPJ NCDOT.GDT 11/10/06

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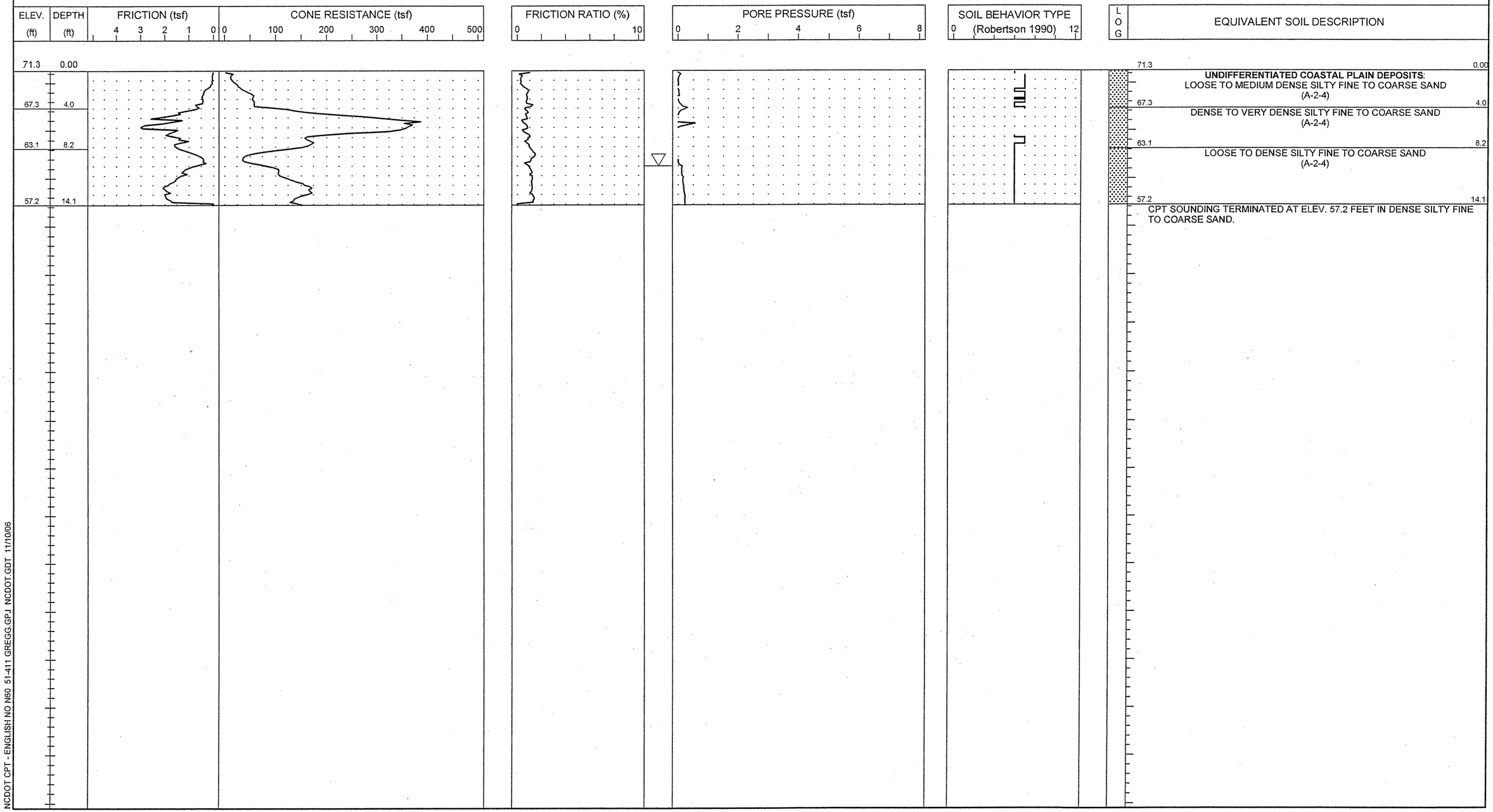
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-32	**BORING LOCATION** 89+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 10.0	**DATE STARTED** 10/22/06	**COMPLETED** 10/22/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 71.3 ft	**NORTHING** 191,147.5	**EASTING** 2,279,079.5	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN		



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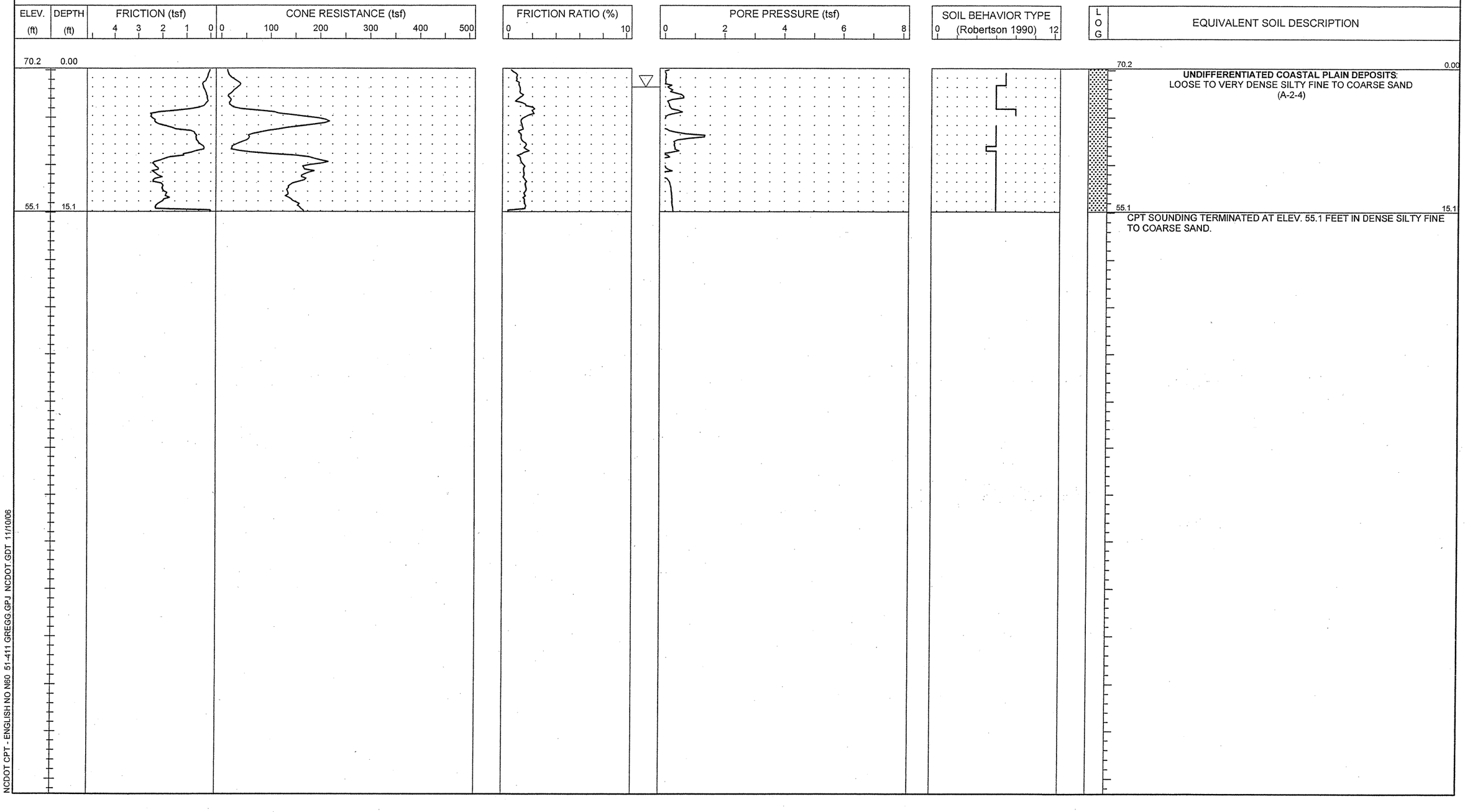
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-33	**BORING LOCATION** 91+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 70.2 ft	**NORTHING** 191,321.3	**EASTING** 2,279,178.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN	



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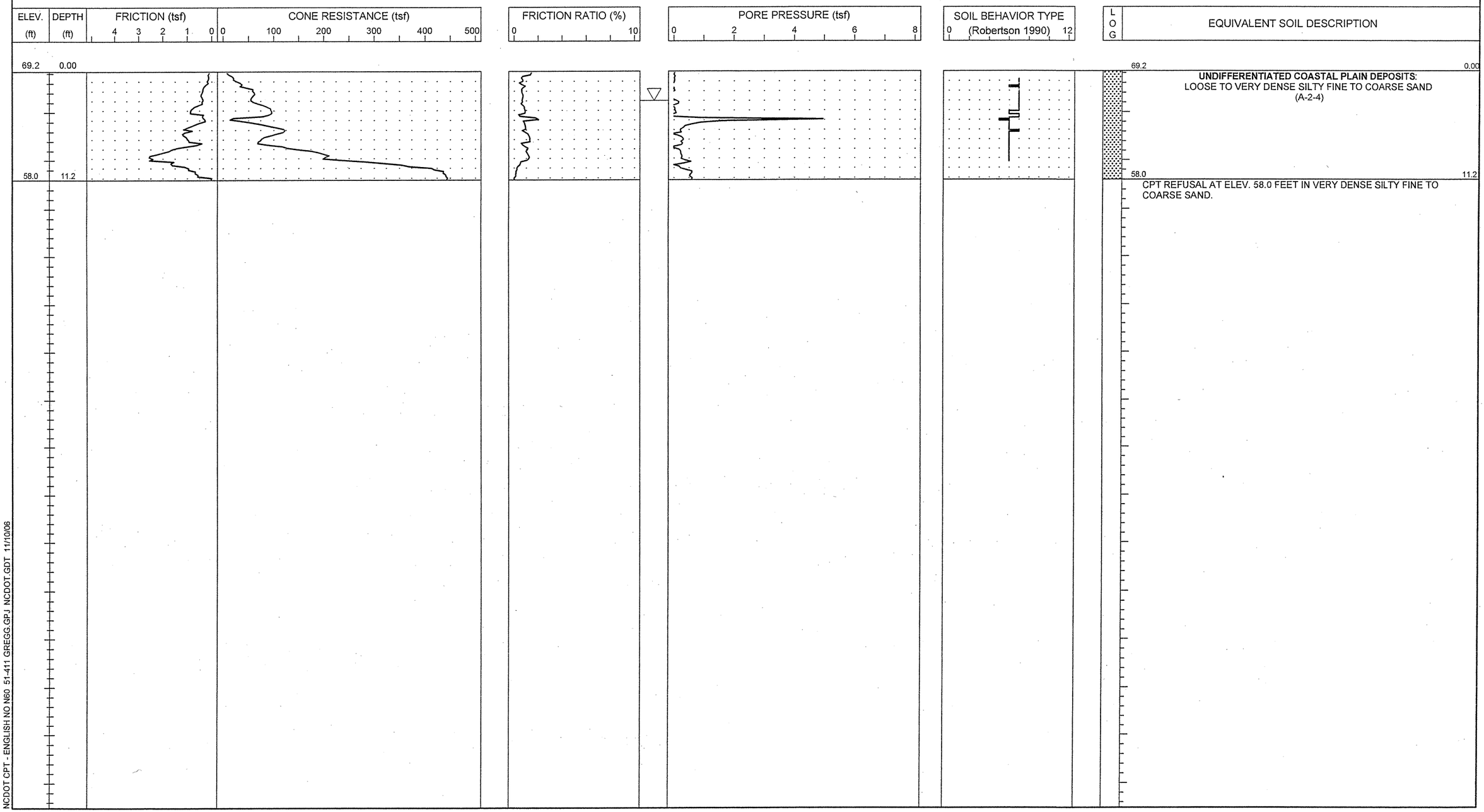
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 11.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-34	**BORING LOCATION** 93+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 69.2 ft	**NORTHING** 191,491.6	**EASTING** 2,279,283.3	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SEAN		



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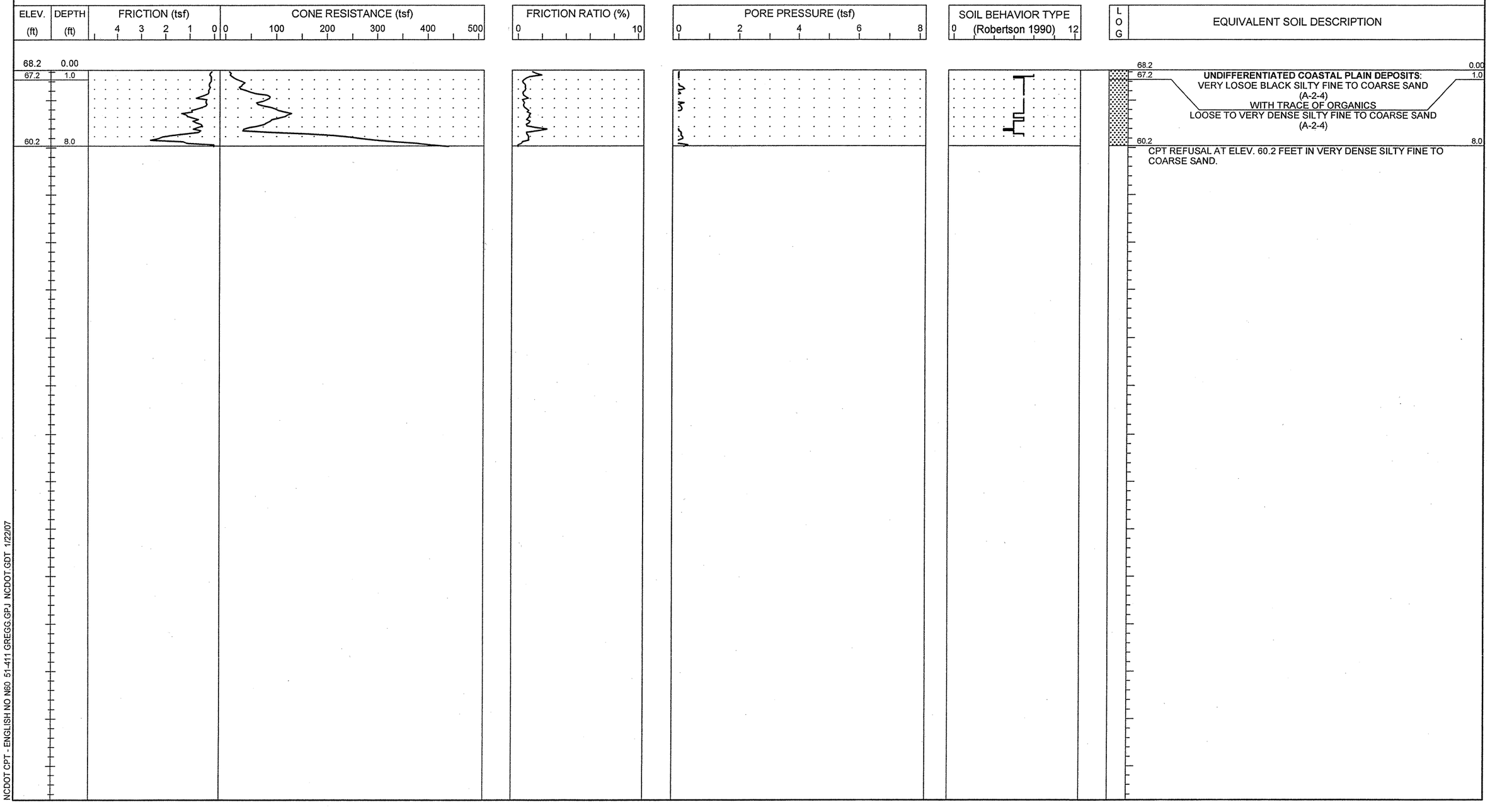
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 8.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-35	**BORING LOCATION** 95+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 68.2 ft	**NORTHING** 191,658.1	**EASTING** 2,279,394.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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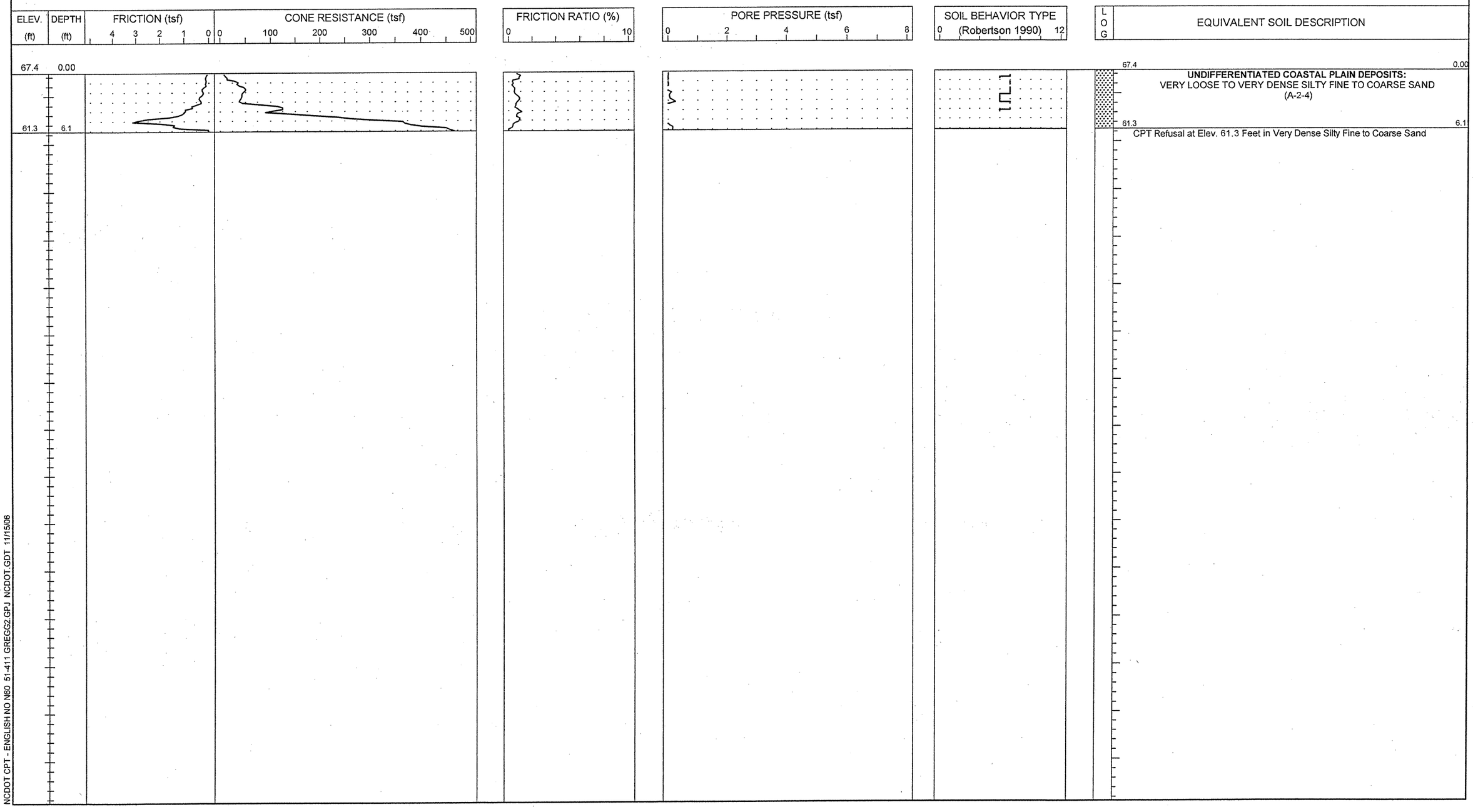
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 6.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-36	**BORING LOCATION** 97+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 67.4 ft	**NORTHING** 191,820.7	**EASTING** 2,279,510.6		**24 HR.** N/A	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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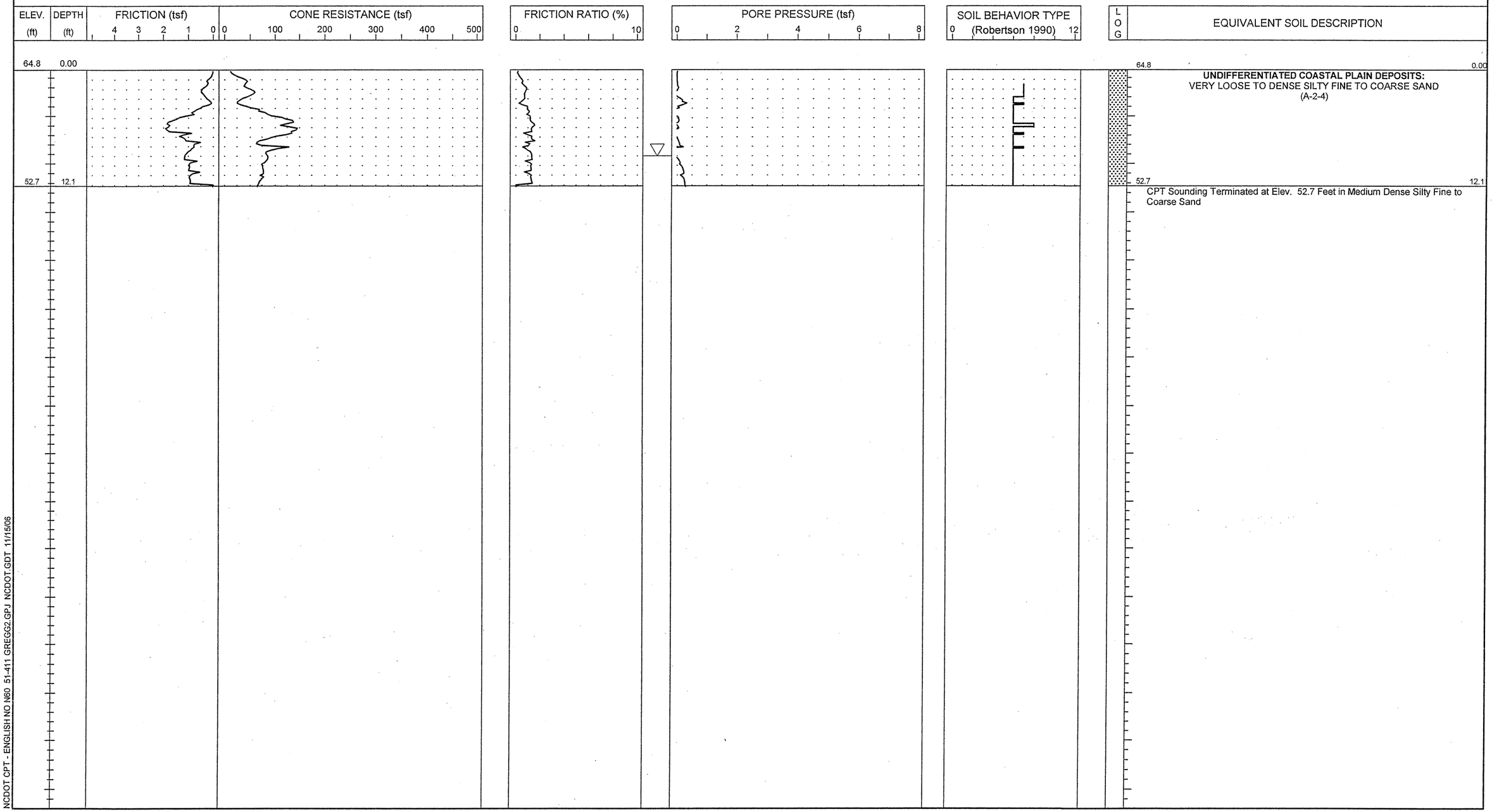
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 12.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-37	**BORING LOCATION** 99+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 9.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 64.8 ft	**NORTHING** 191,979.1	**EASTING** 2,279,632.6	**24 HR.** N/A	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER		



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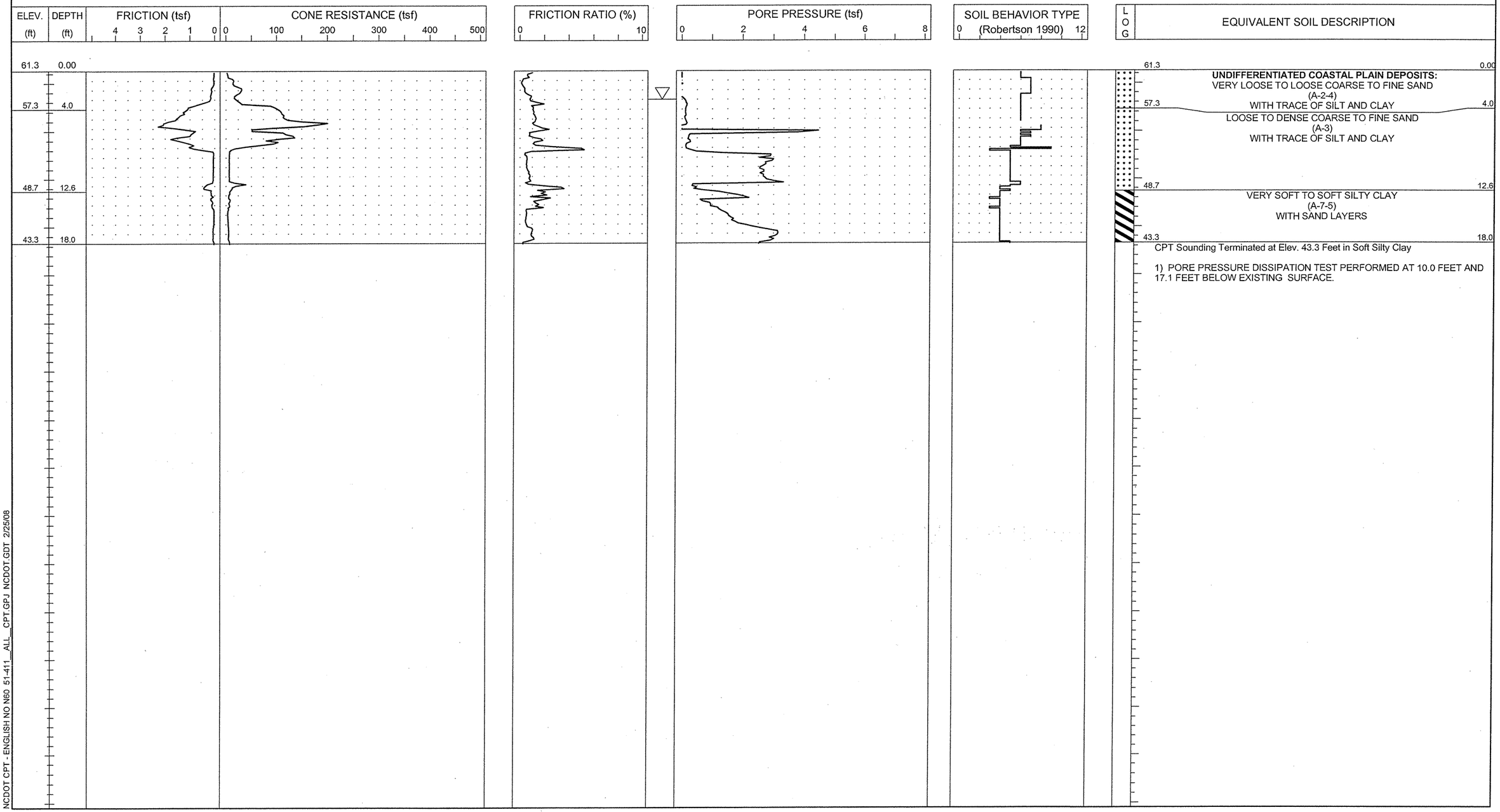
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 38	**BORING LOCATION** 101+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 61.3 ft	**NORTHING** 192,133.2	**EASTING** 2,279,760.2		**24 HR.** N/A	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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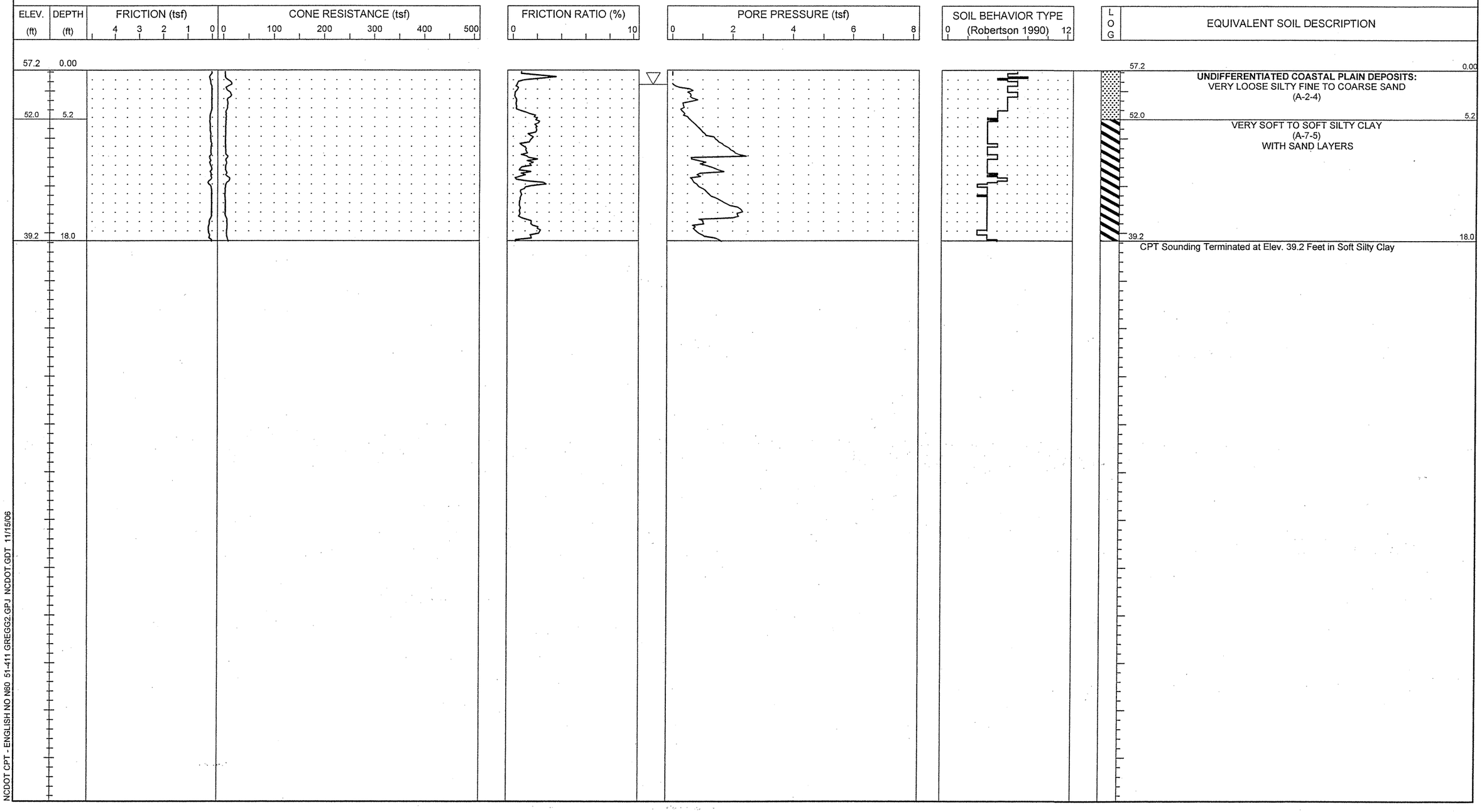
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-39	**BORING LOCATION** 103+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 1.5	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 57.2 ft	**NORTHING** 192,282.7	**EASTING** 2,279,892.9	**24 HR.** N/A	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER		



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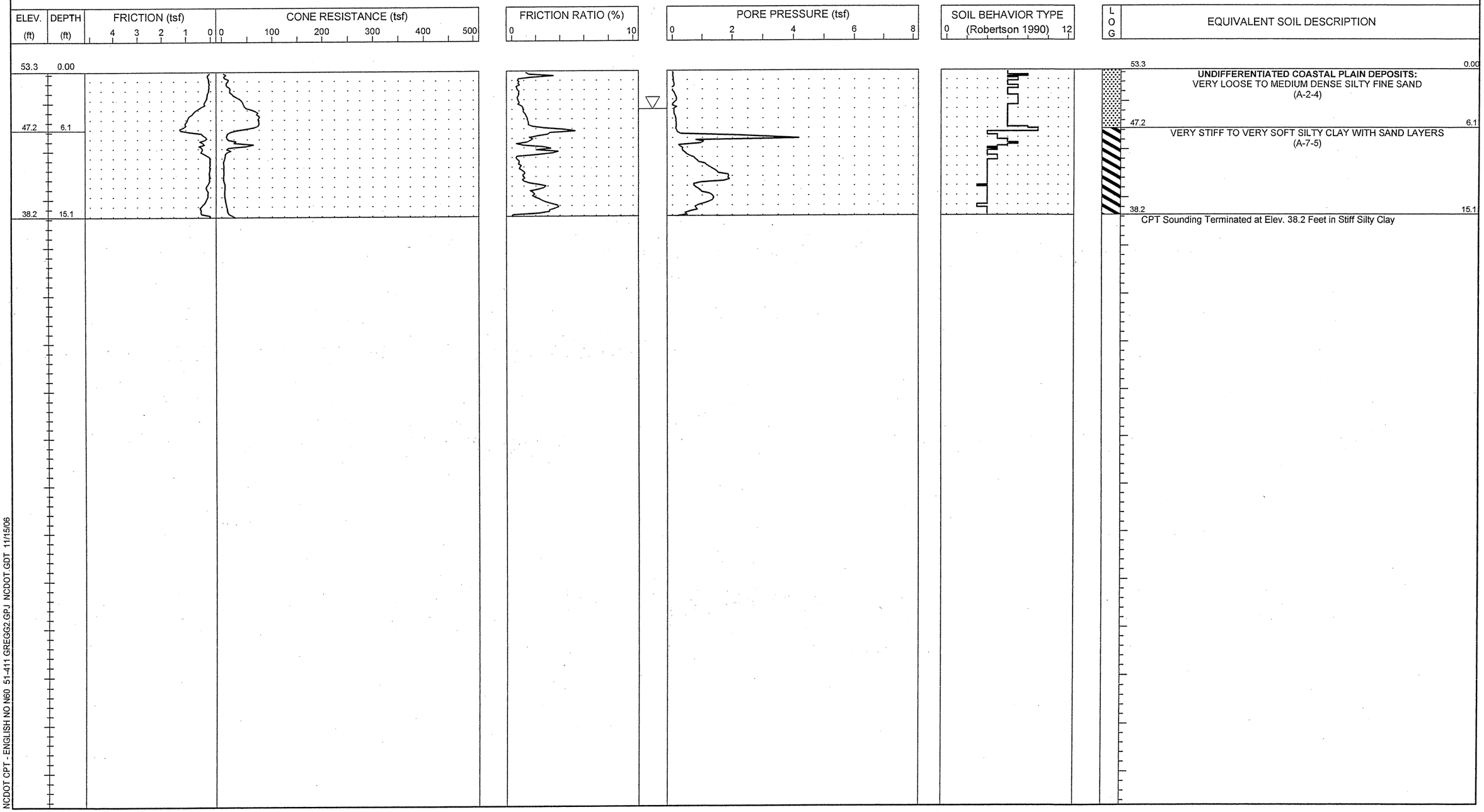
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-40	**BORING LOCATION** 105+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 53.3 ft	**NORTHING** 192,427.5	**EASTING** 2,280,030.9		**24 HR.** N/A	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER		



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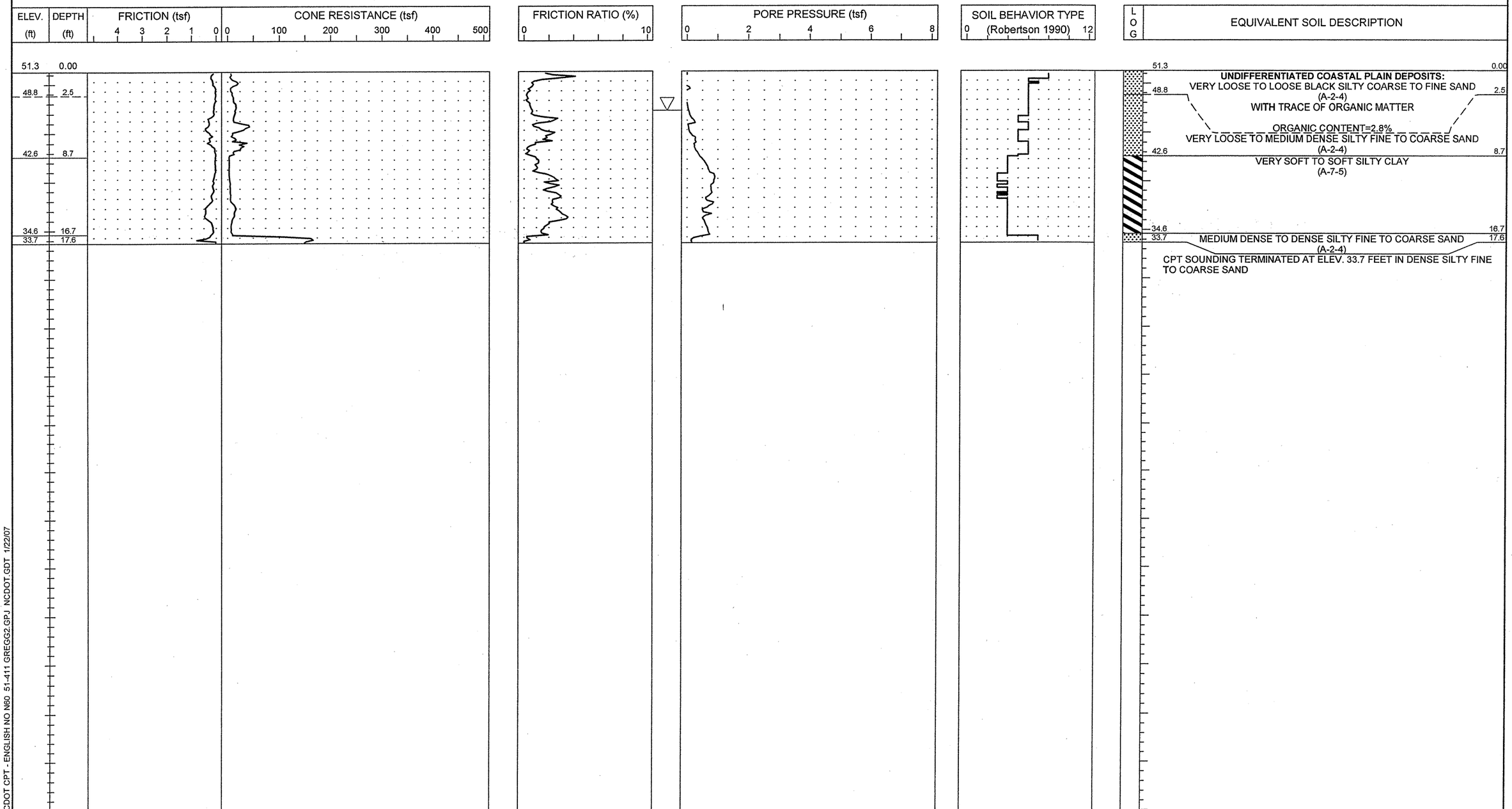
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.6 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-41	**BORING LOCATION** 106+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 51.3 ft	**NORTHING** 192,498.1	**EASTING** 2,280,101.7		**24 HR.** N/A	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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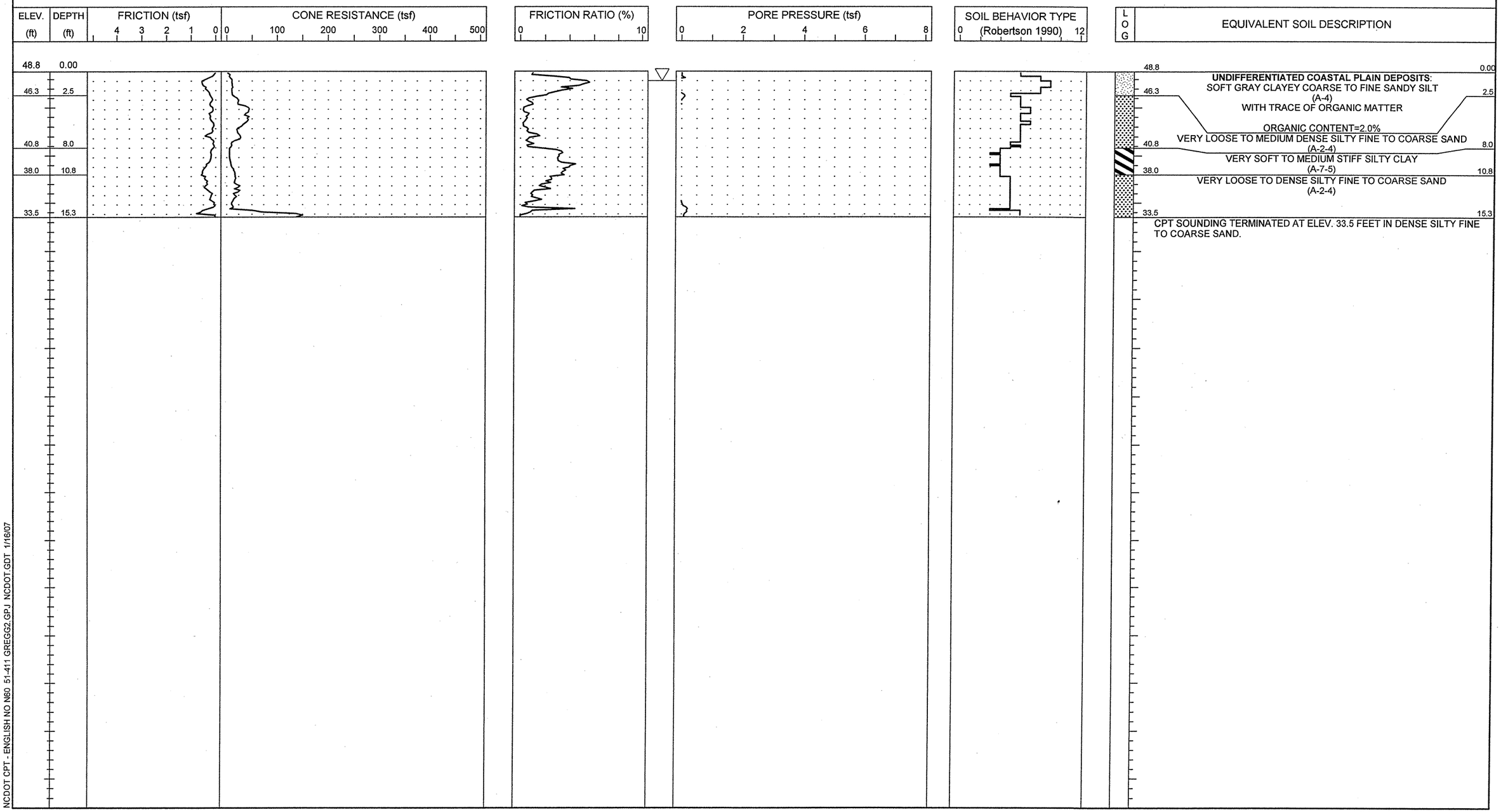
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.3 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-42	**BORING LOCATION** 108+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 48.8 ft	**NORTHING** 192,635.6	**EASTING** 2,280,247.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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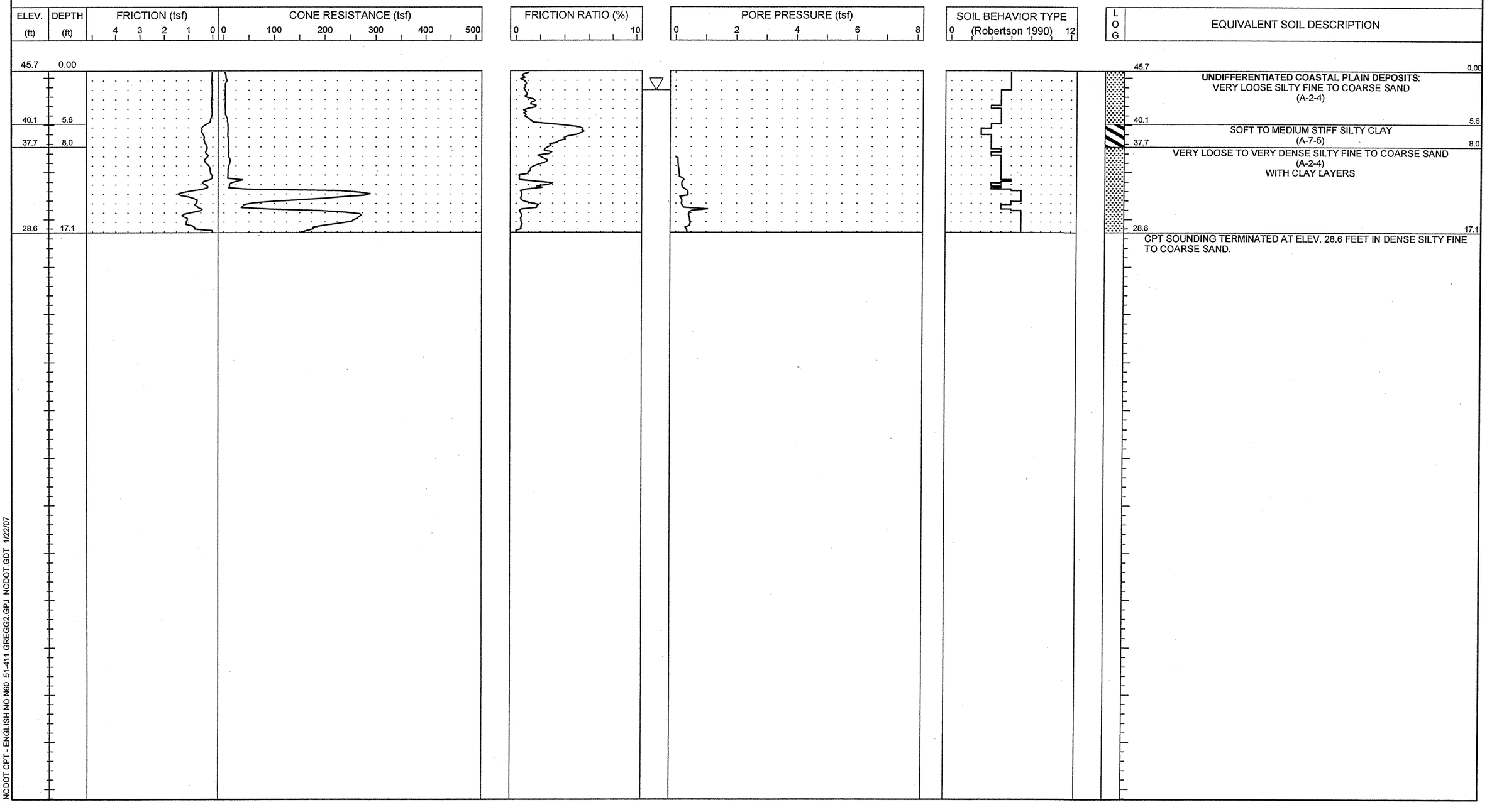
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-43	**BORING LOCATION** 110+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 45.7 ft	**NORTHING** 192,767.9	**EASTING** 2,280,396.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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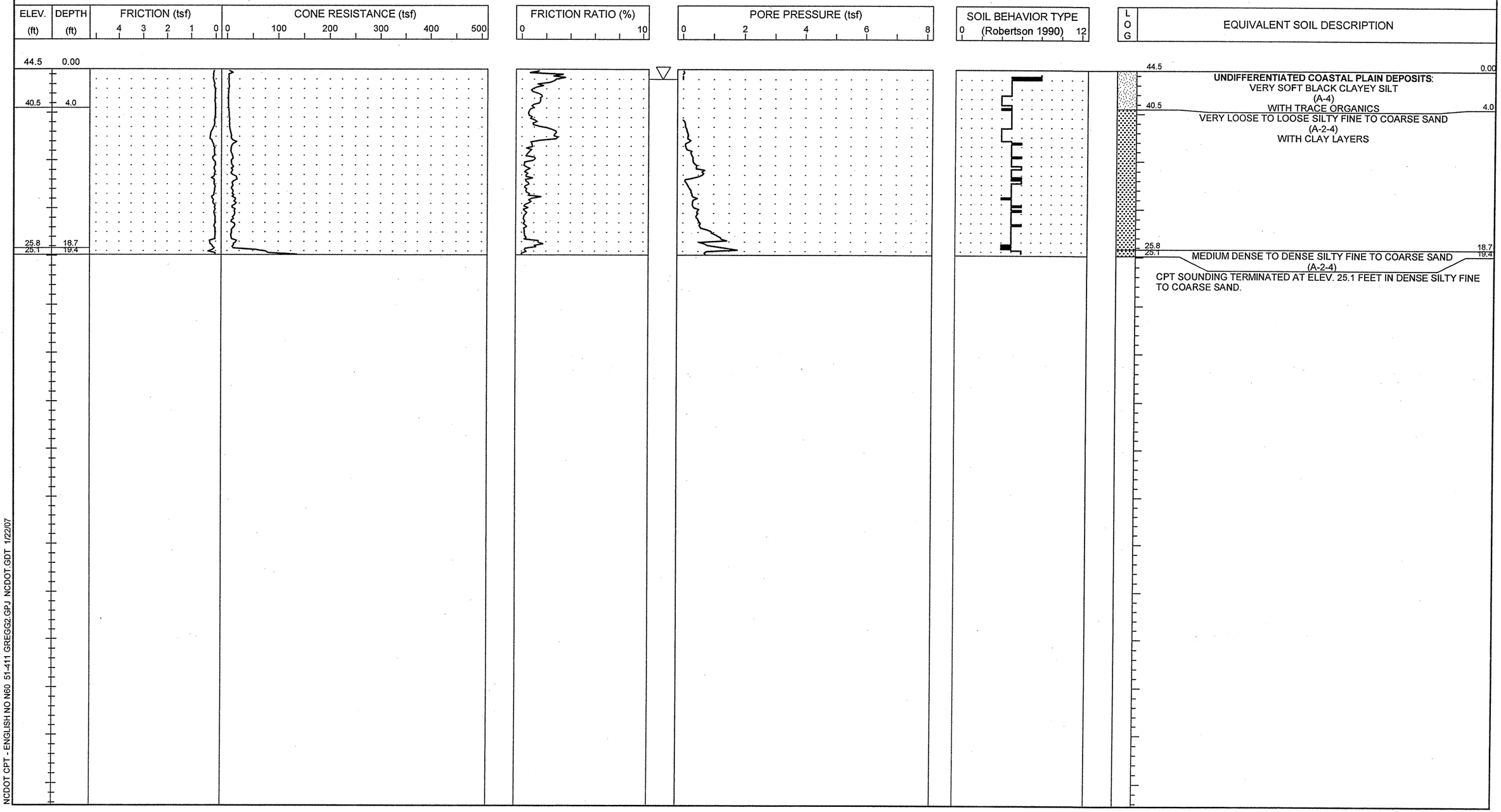
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 19.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-44	**BORING LOCATION** 112+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 44.5 ft	**NORTHING** 192,894.9	**EASTING** 2,280,551.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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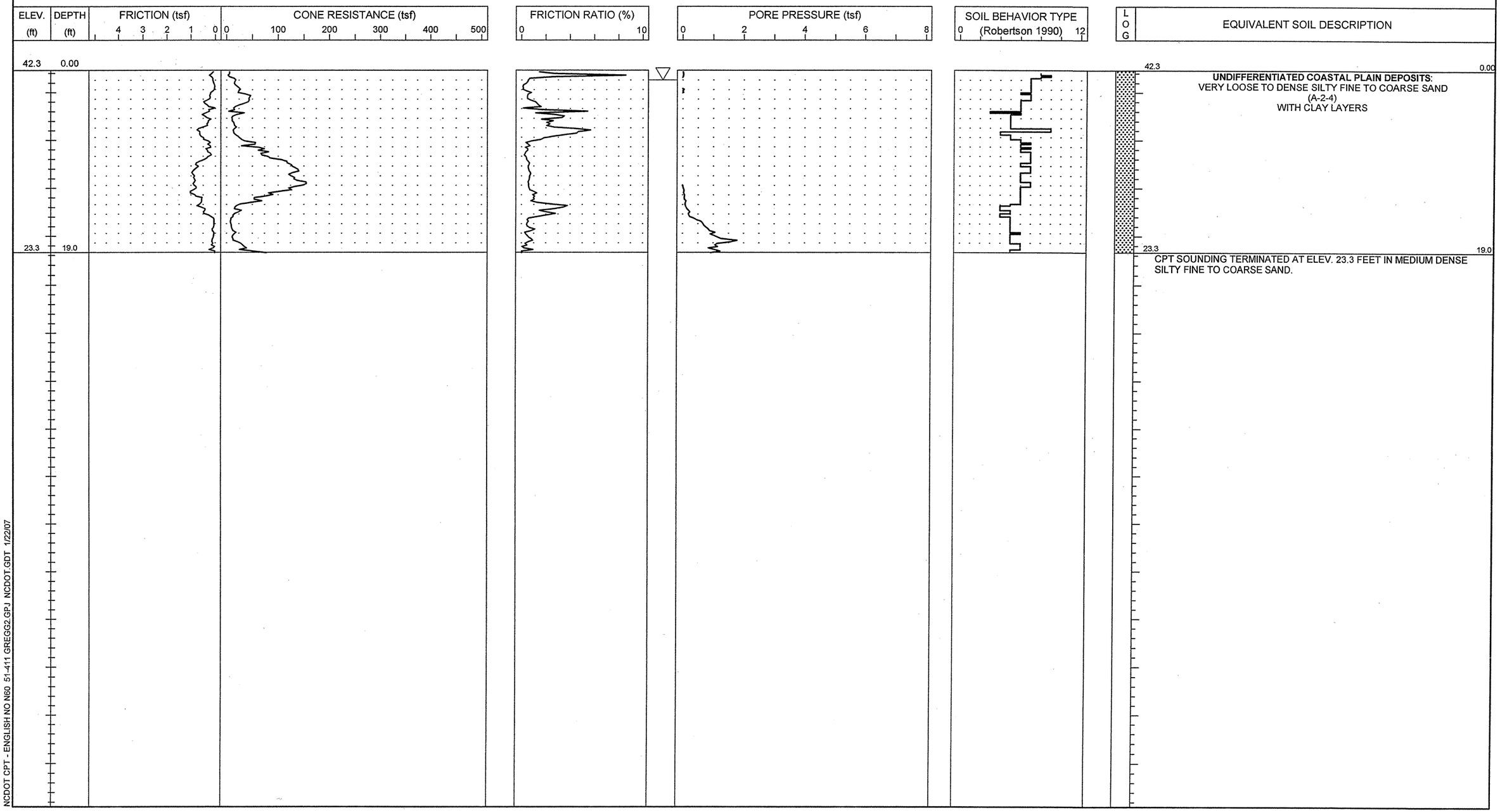
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 19.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-45	**BORING LOCATION** 114+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.3 ft	**NORTHING** 193,016.4	**EASTING** 2,280,710.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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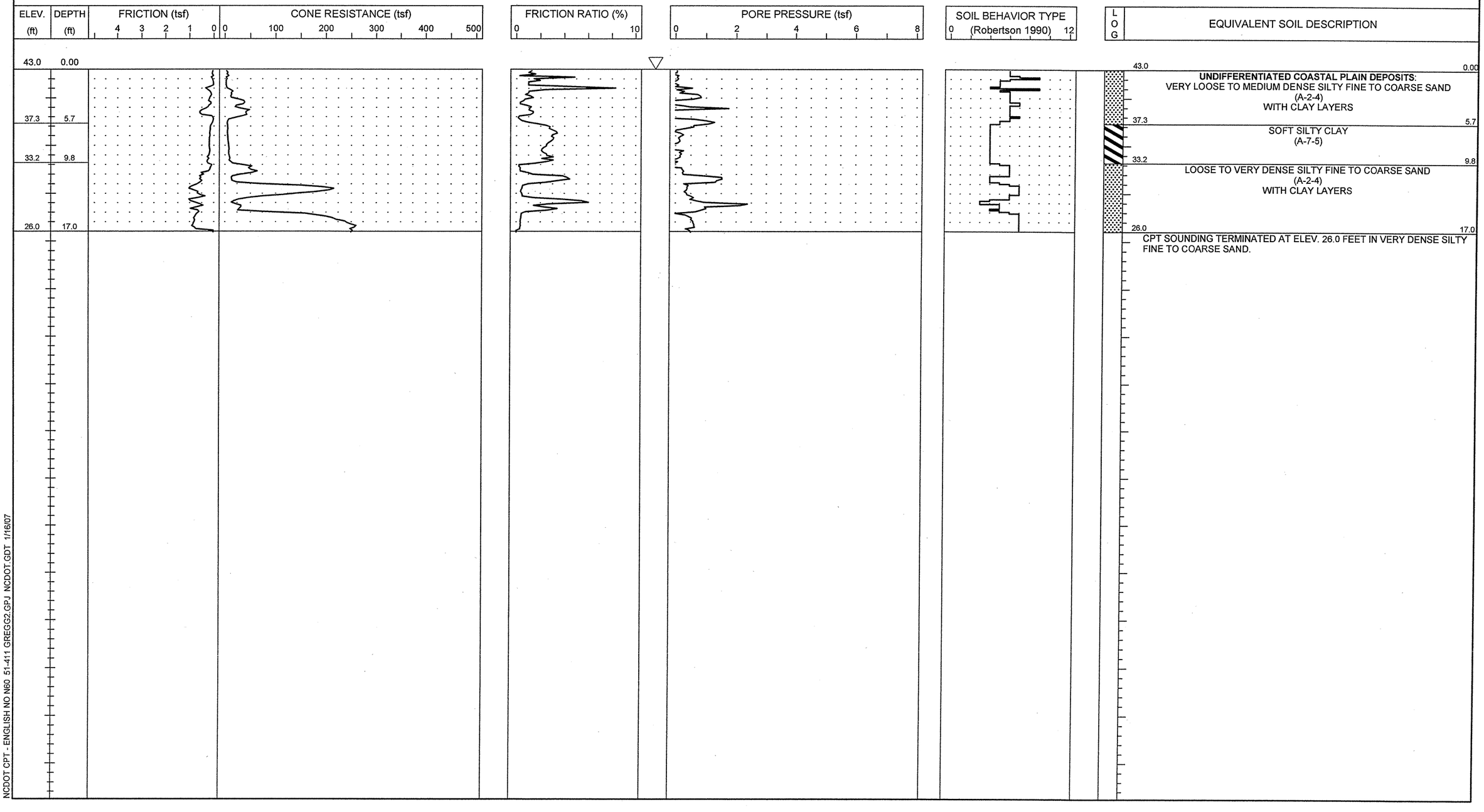
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push / **HAMMER TYPE** N/A
BORING NO. C-46	**BORING LOCATION** 116+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 43.0 ft	**NORTHING** 193,132.4	**EASTING** 2,280,873.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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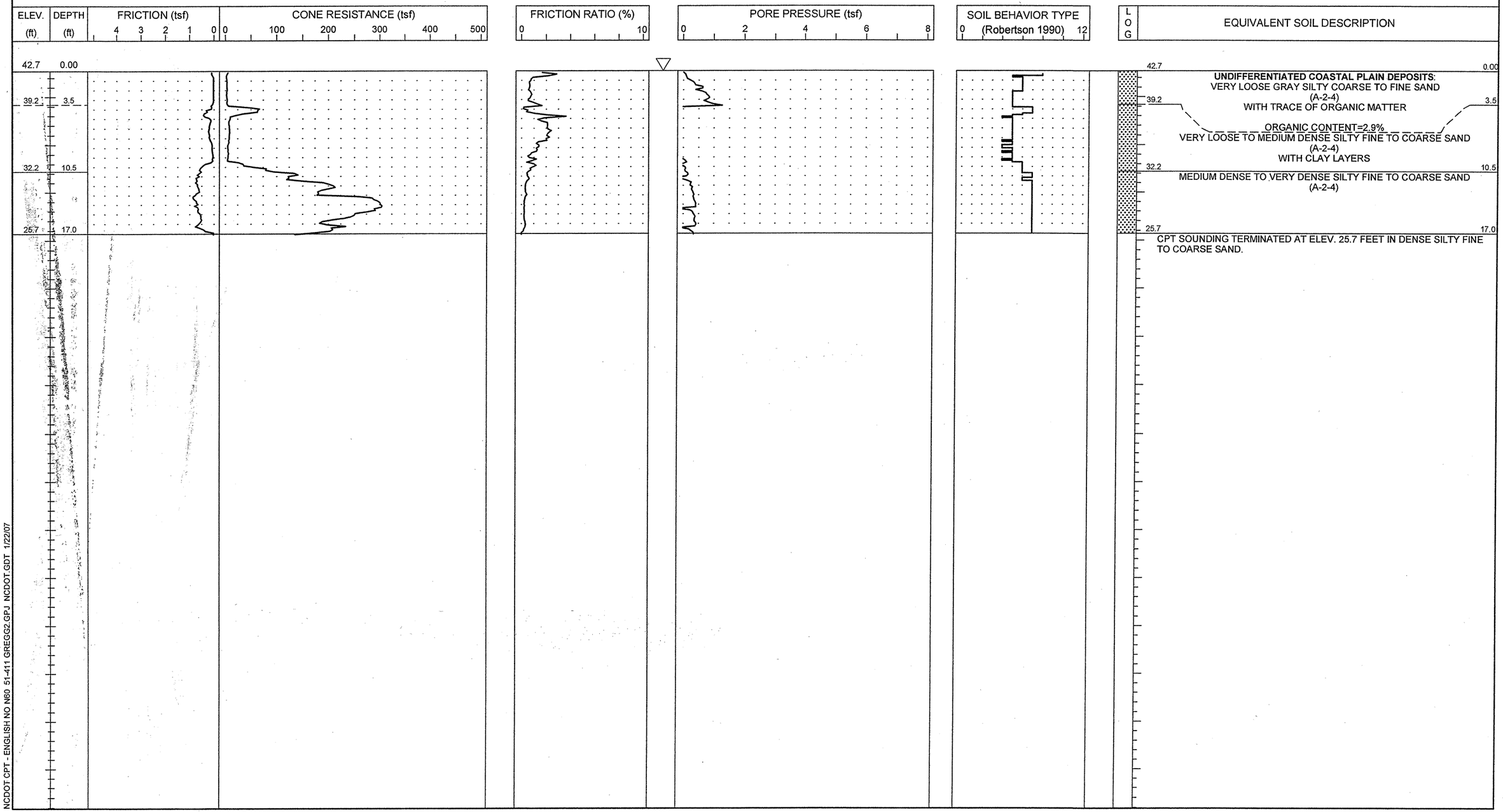
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-47	**BORING LOCATION** 118+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 42.7 ft	**NORTHING** 193,242.6	**EASTING** 2,281,040.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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BORING LOG

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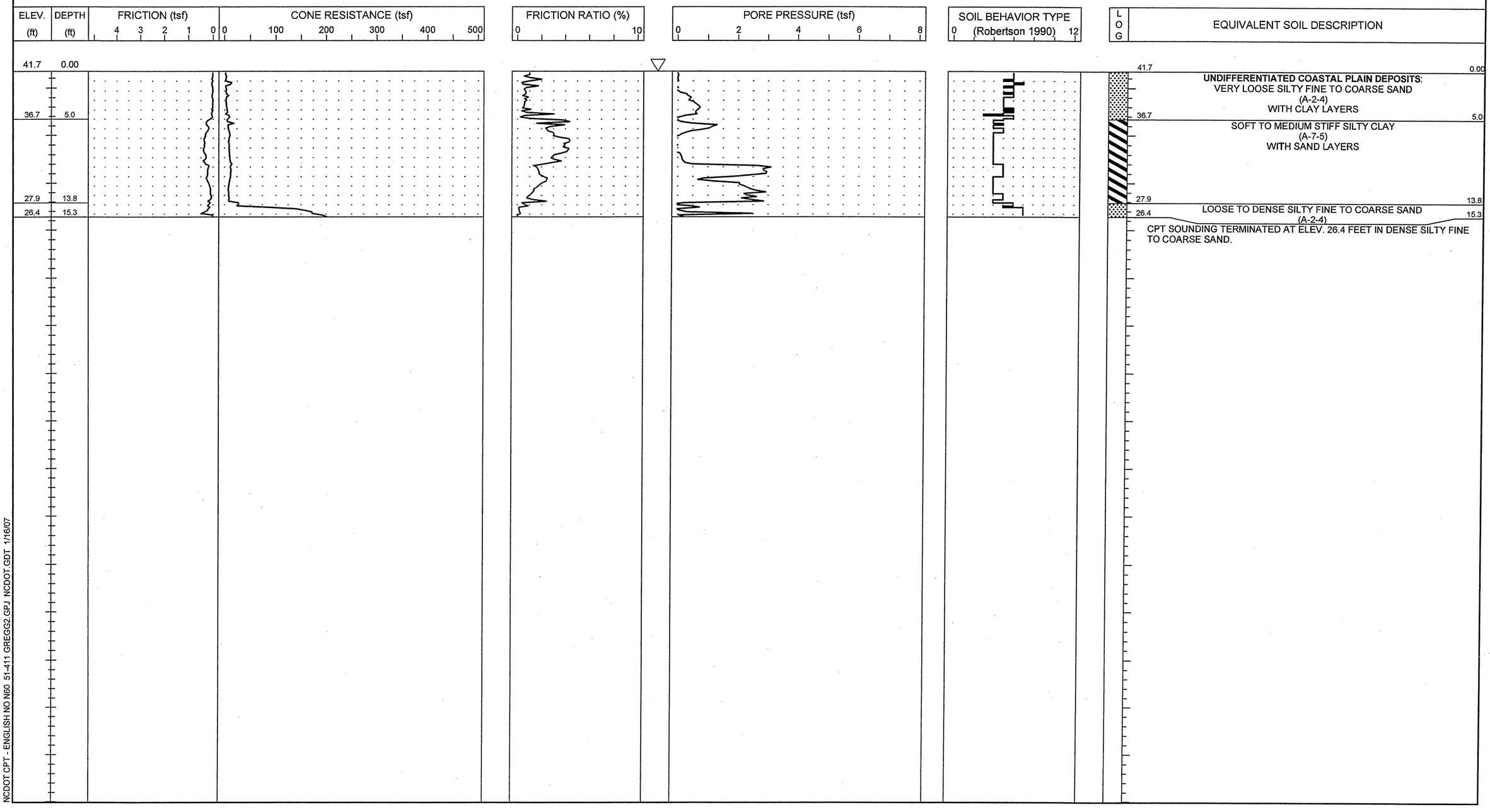
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.3 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-48	**BORING LOCATION** 120+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 41.7 ft	**NORTHING** 193,347.0	**EASTING** 2,281,210.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 1/16/07

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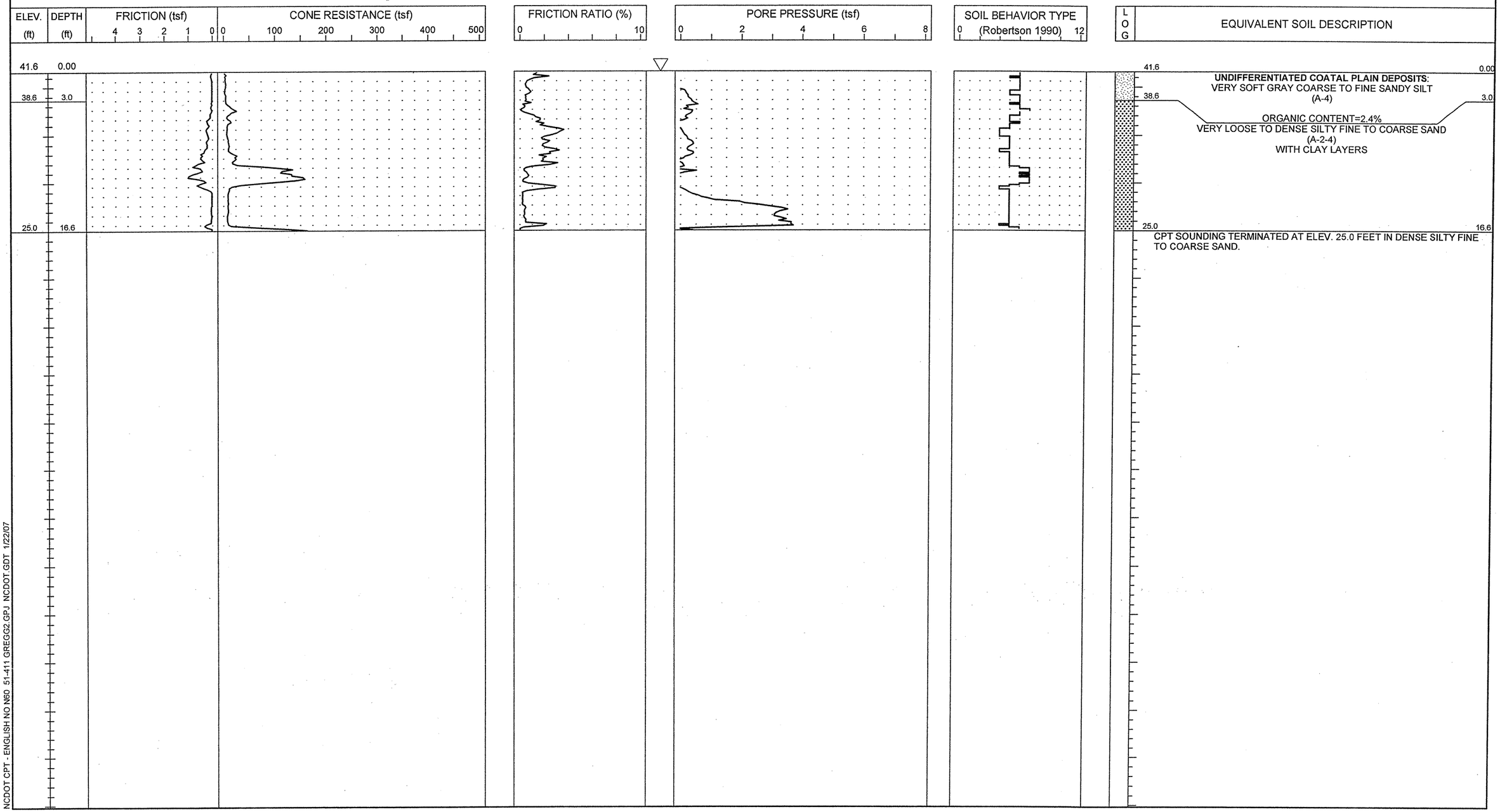
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 16.6 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-49	**BORING LOCATION** 122+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 41.6 ft	**NORTHING** 193,445.4	**EASTING** 2,281,384.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 1/22/07

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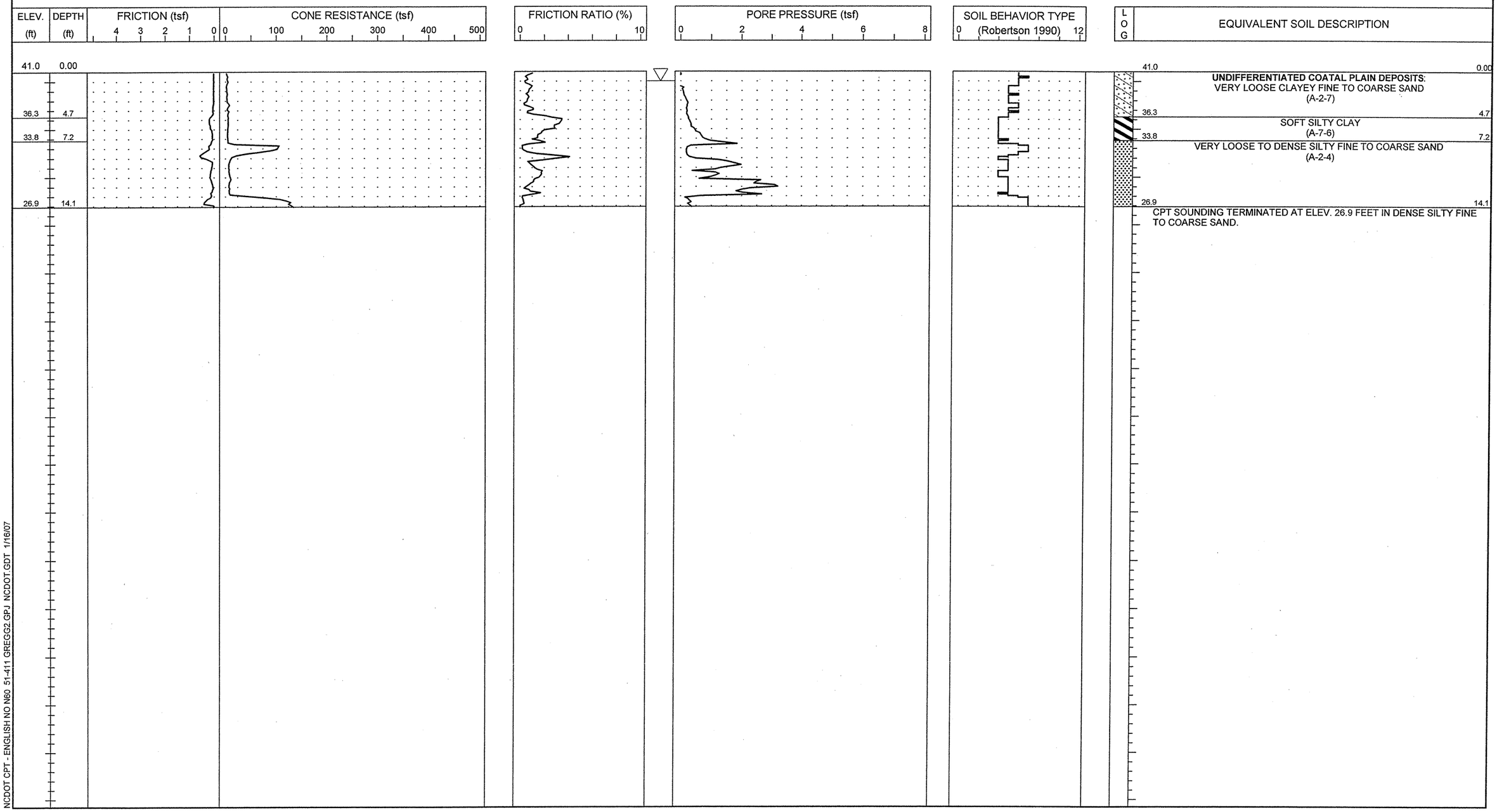
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-50	**BORING LOCATION** 124+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 41.0 ft	**NORTHING** 193,537.6	**EASTING** 2,281,562.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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BORING LOG

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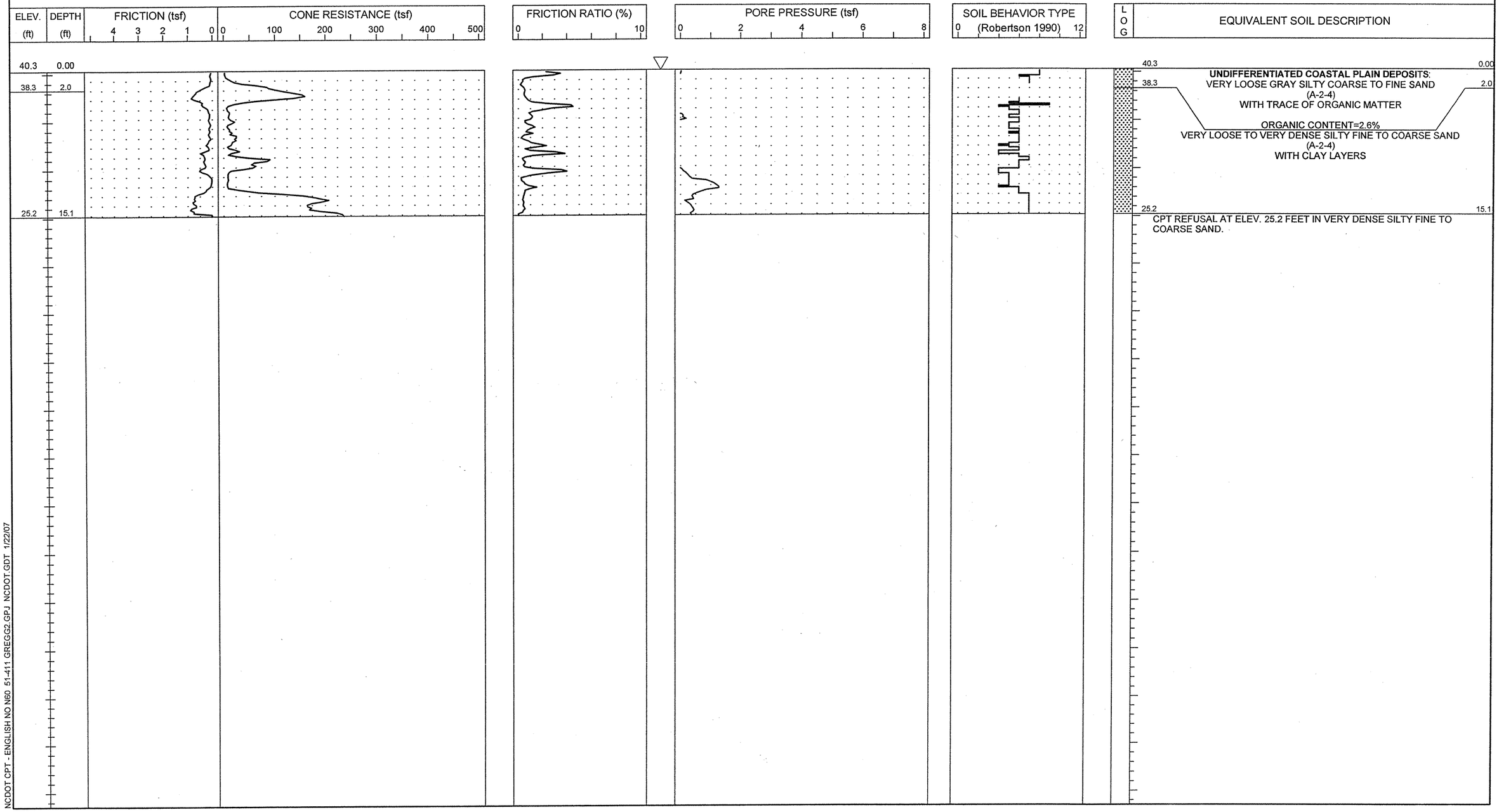
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-51	**BORING LOCATION** 126+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 40.3 ft	**NORTHING** 193,623.6	**EASTING** 2,281,742.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 1/22/07

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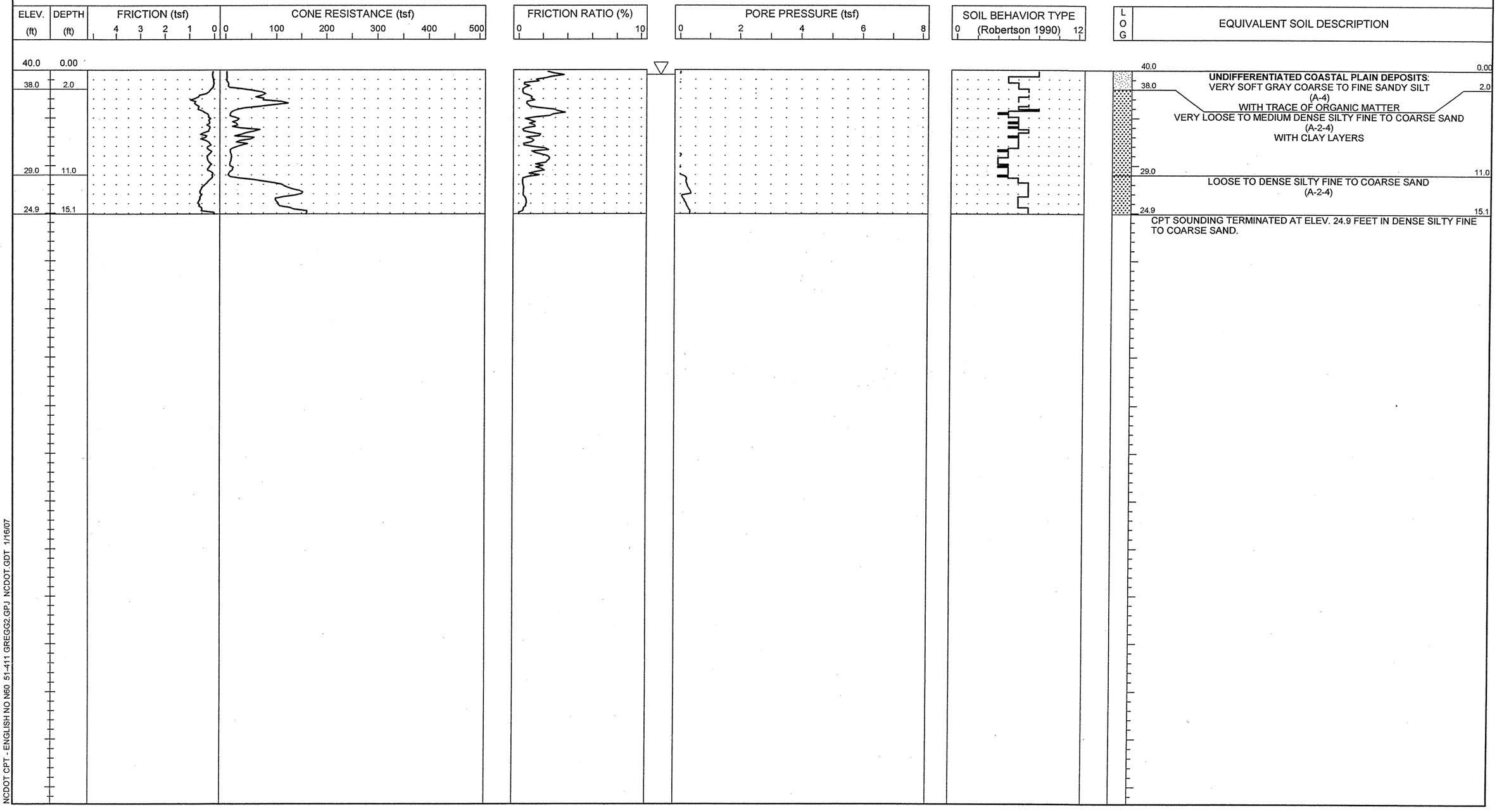
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push / **HAMMER TYPE** N/A
BORING NO. C-52	**BORING LOCATION** 128+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.5	**DATE STARTED** 10/23/06	**COMPLETED** 10/23/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.0 ft	**NORTHING** 193,703.3	**EASTING** 2,281,926.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60_51-411 GREGG2.GPJ NCDOT.GDT 1/16/07

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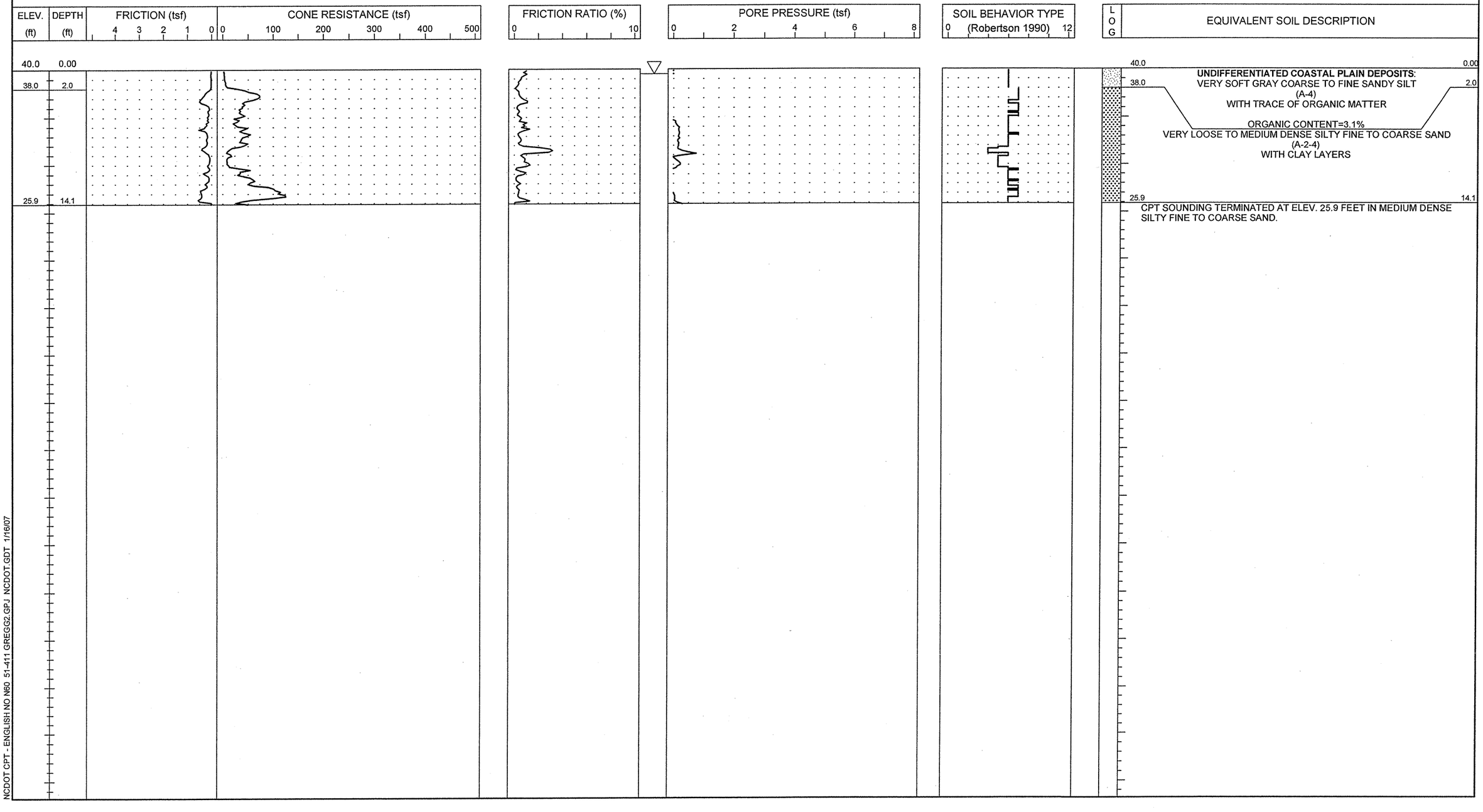
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-53	**BORING LOCATION** 130+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.5	**DATE STARTED** 10/24/06	**COMPLETED** 10/24/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.0 ft	**NORTHING** 193,776.6	**EASTING** 2,282,112.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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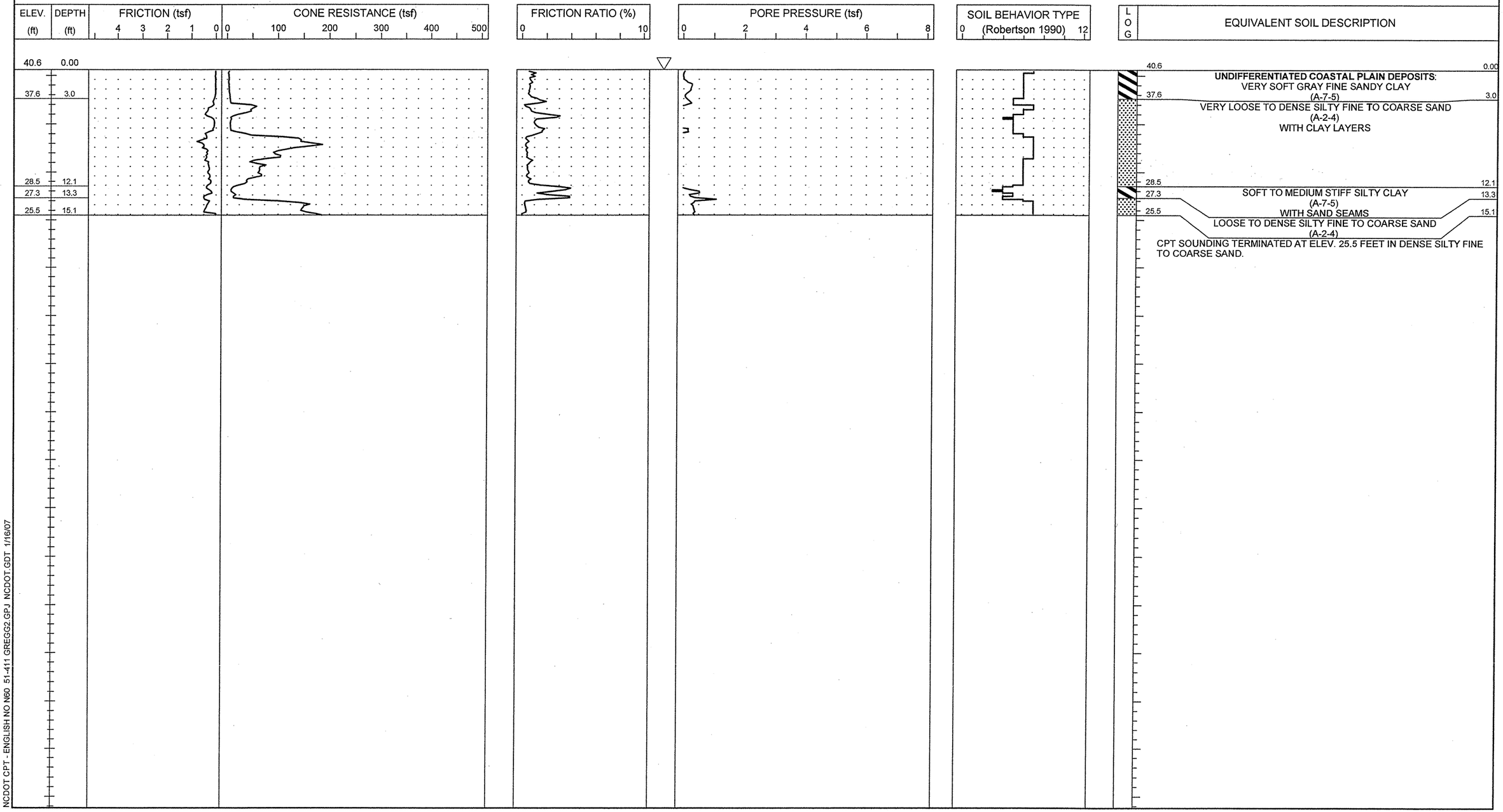
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push / **HAMMER TYPE** N/A
BORING NO. C-54	**BORING LOCATION** 132+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/24/06	**COMPLETED** 10/24/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.6 ft	**NORTHING** 193,843.3	**EASTING** 2,282,300.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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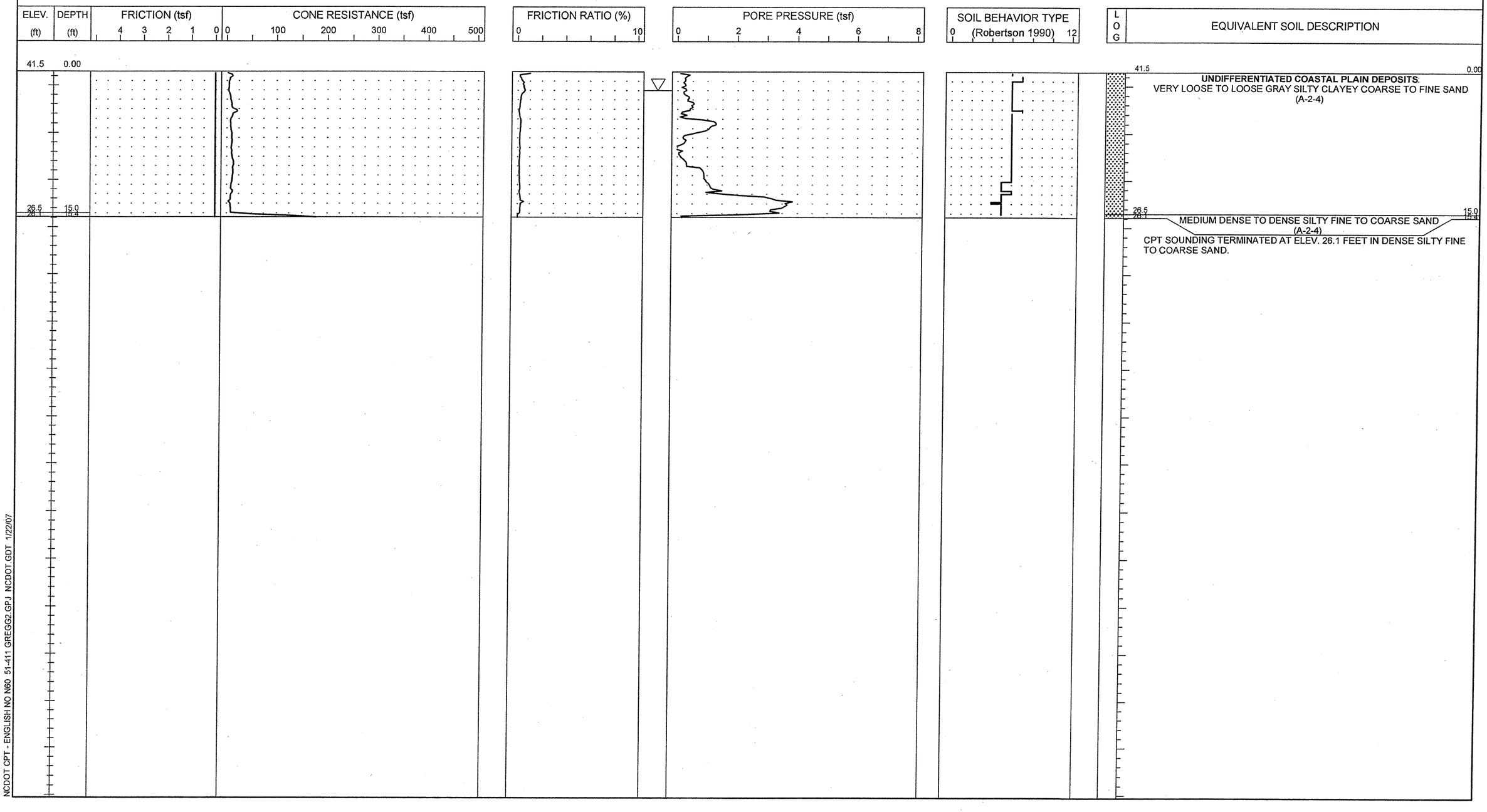
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-55	**BORING LOCATION** 134+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/24/06	**COMPLETED** 10/24/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 41.5 ft	**NORTHING** 193,903.5	**EASTING** 2,282,491.5		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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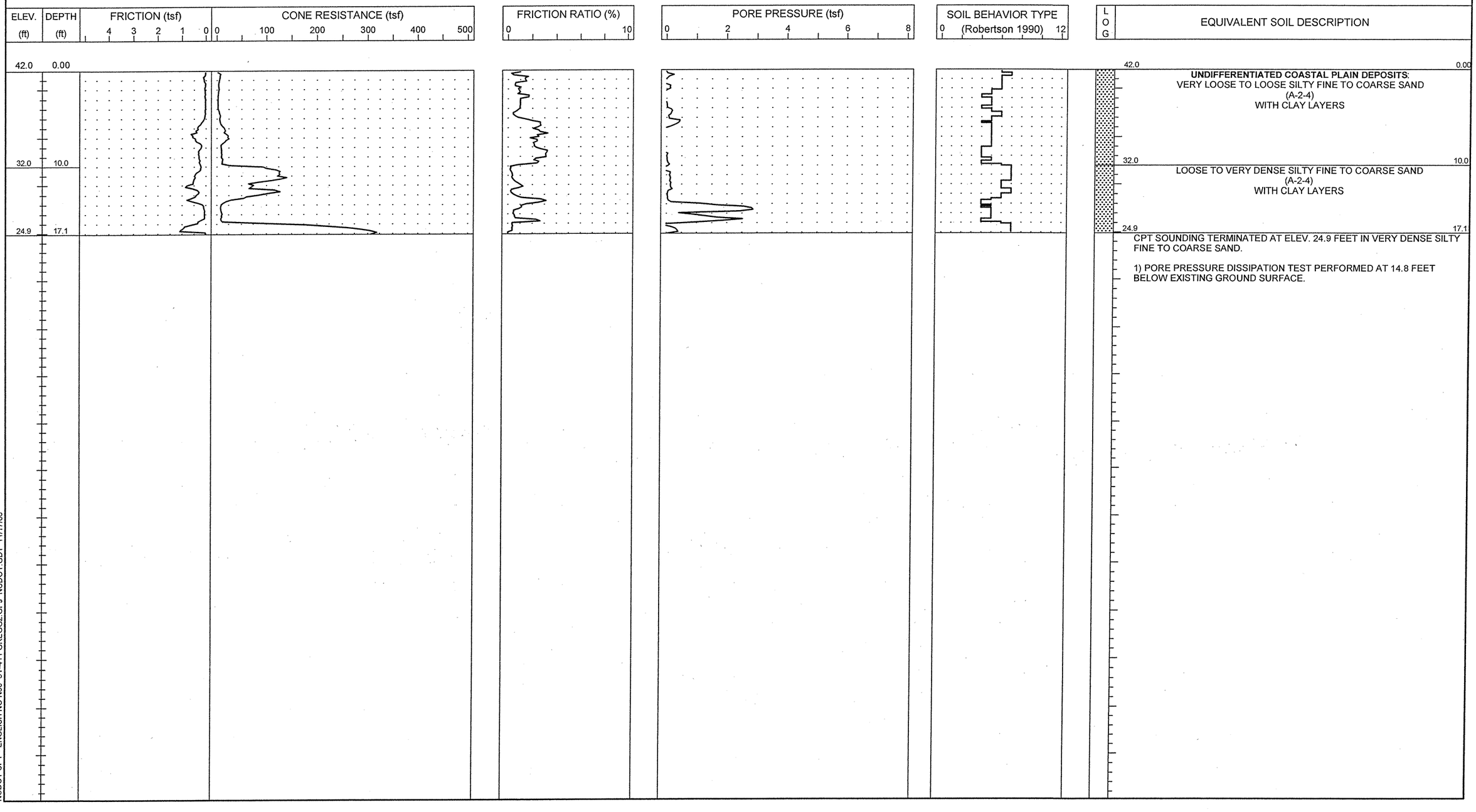
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-56	**BORING LOCATION** 136+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/24/06	**COMPLETED** 10/24/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.0 ft	**NORTHING** 193,957.0	**EASTING** 2,282,684.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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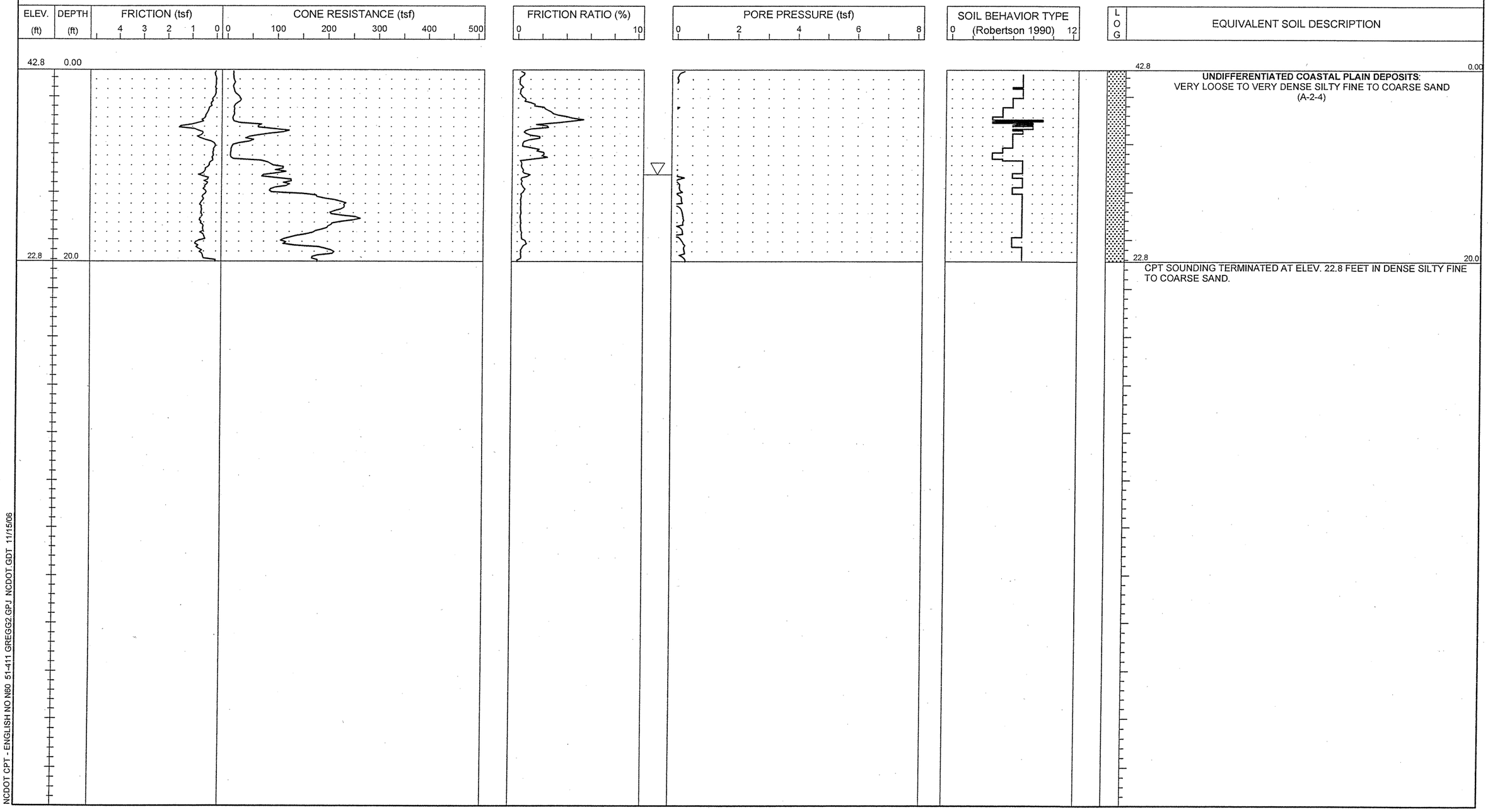
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 20.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-57	**BORING LOCATION** 138+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 11.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.8 ft	**NORTHING** 194,003.7	**EASTING** 2,282,878.7		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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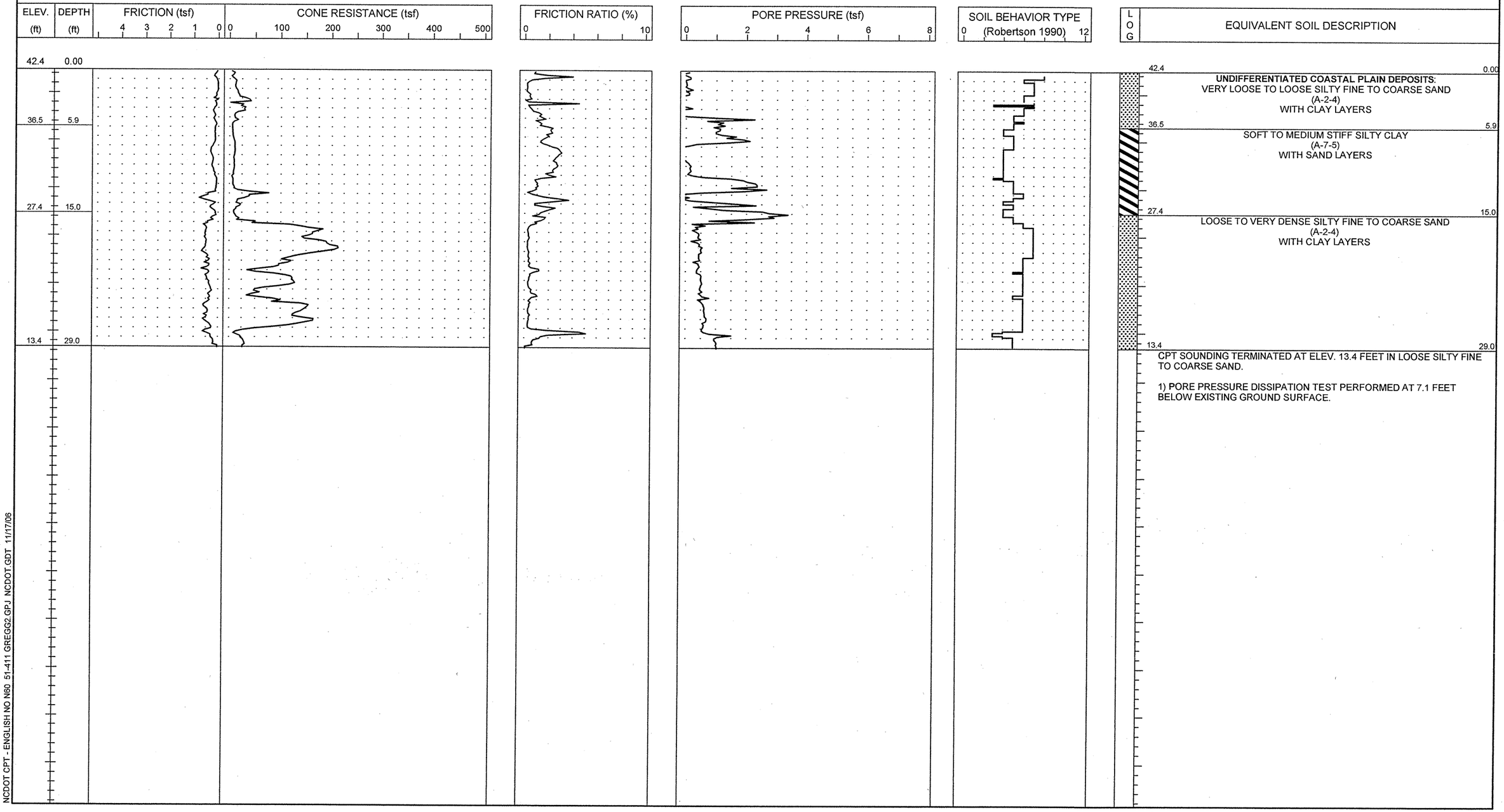
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 29.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-58	**BORING LOCATION** 140+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.4 ft	**NORTHING** 194,043.7	**EASTING** 2,283,074.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



LOG

EQUIVALENT SOIL DESCRIPTION

42.4 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE TO LOOSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

36.5 — 5.9

SOFT TO MEDIUM STIFF SILTY CLAY
(A-7-5)
WITH SAND LAYERS

27.4 — 15.0

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

13.4 — 29.0

CPT SOUNDING TERMINATED AT ELEV. 13.4 FEET IN LOOSE SILTY FINE TO COARSE SAND.

1) PORE PRESSURE DISSIPATION TEST PERFORMED AT 7.1 FEET BELOW EXISTING GROUND SURFACE.

NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 11/17/06

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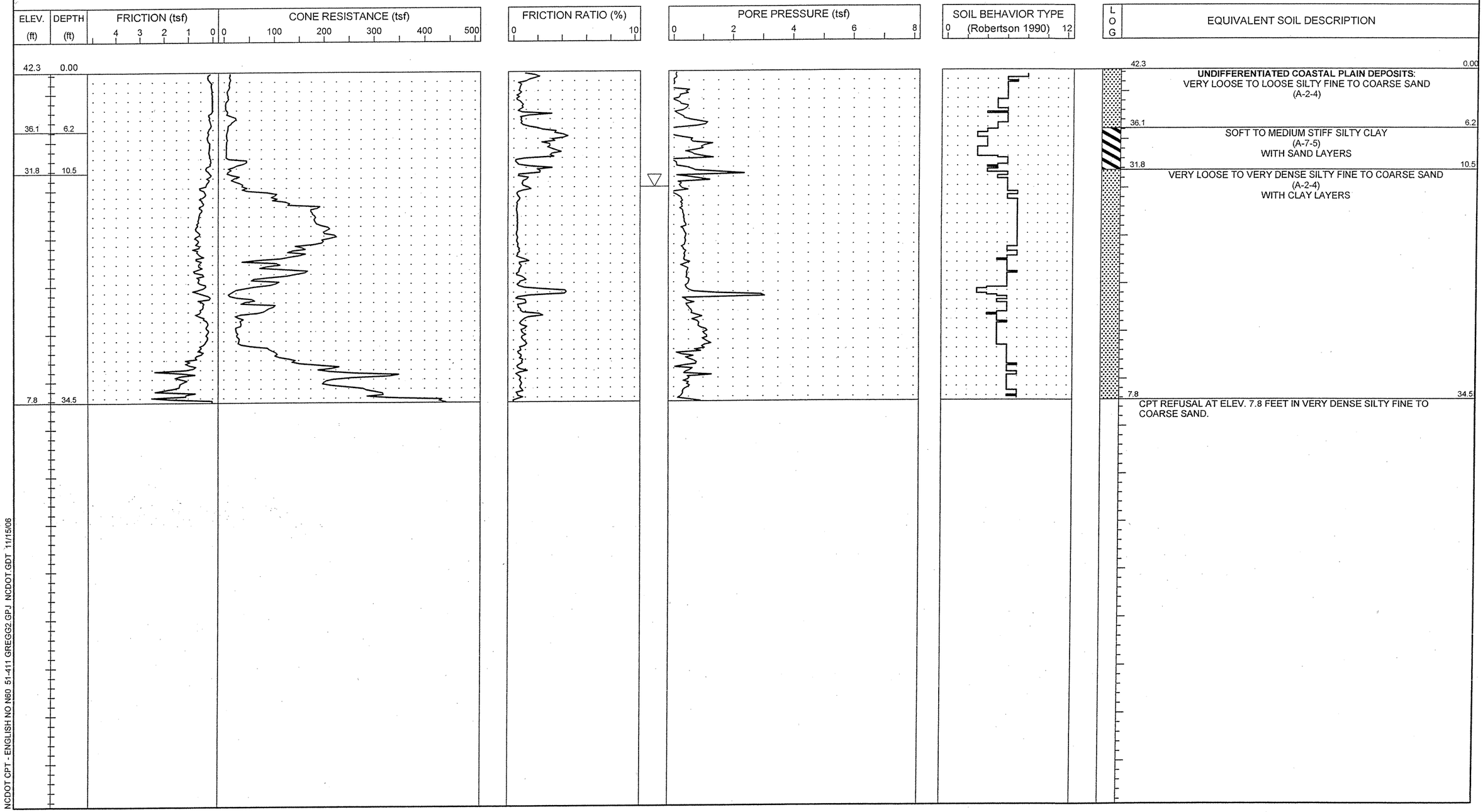
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 34.5 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-59	**BORING LOCATION** 142+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 12.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.3 ft	**NORTHING** 194,076.8	**EASTING** 2,283,271.8		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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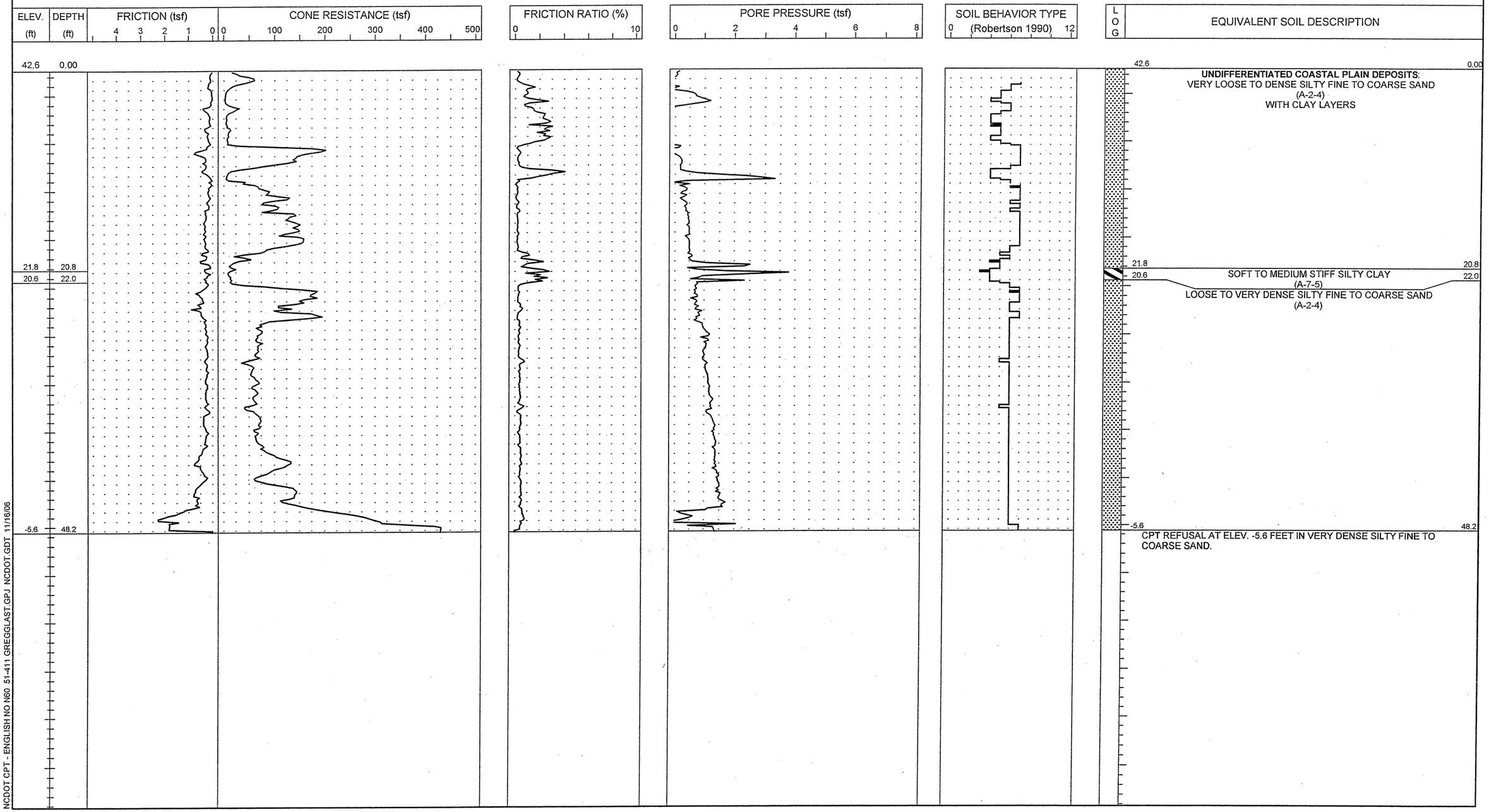
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 48.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 60	**BORING LOCATION** 144+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 42.6 ft	**NORTHING** 194,103.0	**EASTING** 2,283,470.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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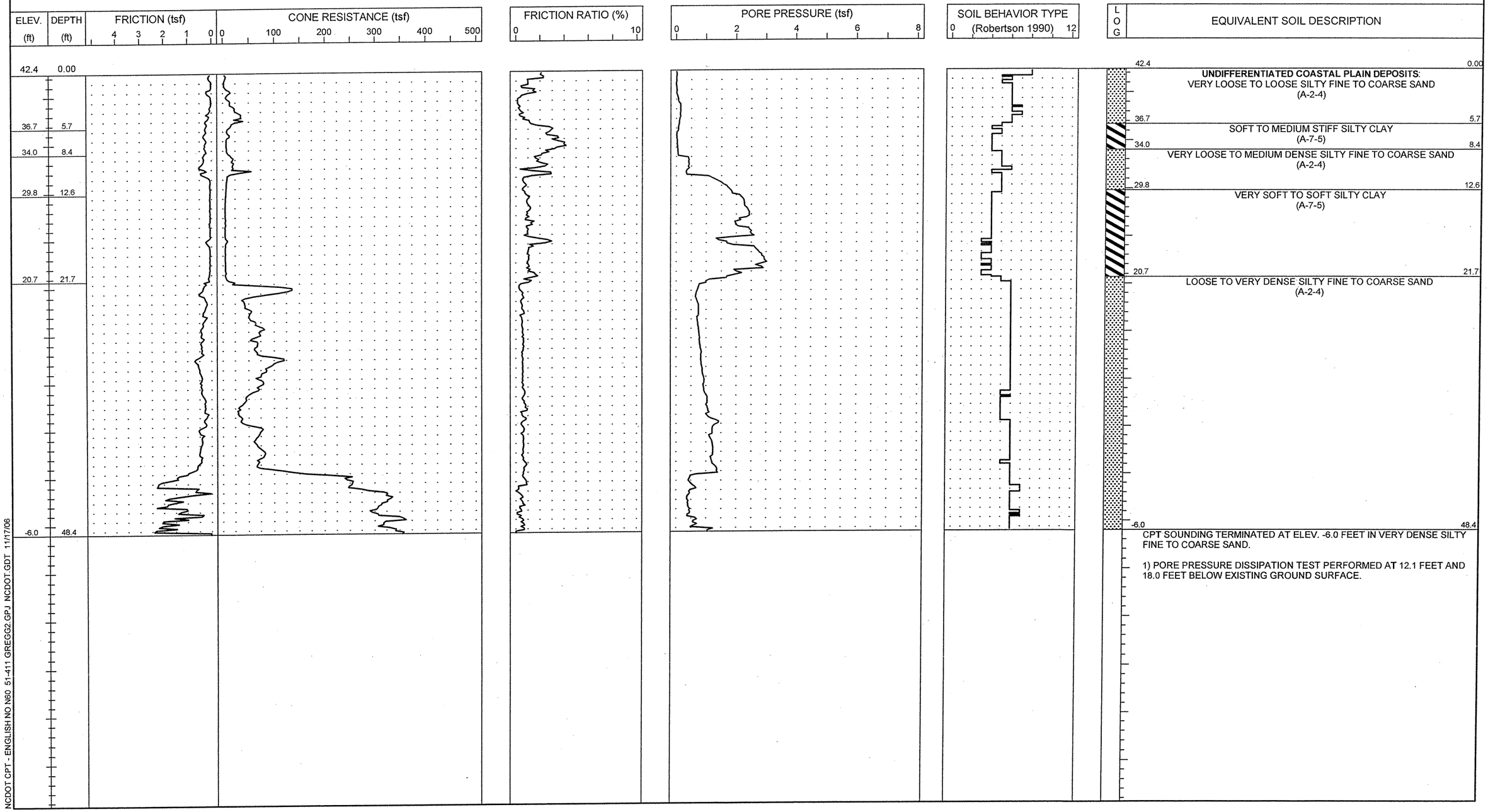
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 48.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-61	**BORING LOCATION** 150+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/27/06	**COMPLETED** 10/27/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 42.4 ft	**NORTHING** 194,140.2	**EASTING** 2,284,068.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



42.4 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE TO LOOSE SILTY FINE TO COARSE SAND
(A-2-4)

36.7 — 5.7

SOFT TO MEDIUM STIFF SILTY CLAY
(A-7-5)

34.0 — 8.4

VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(A-2-4)

29.8 — 12.6

VERY SOFT TO SOFT SILTY CLAY
(A-7-5)

20.7 — 21.7

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)

-6.0 — 48.4

CPT SOUNDING TERMINATED AT ELEV. -6.0 FEET IN VERY DENSE SILTY FINE TO COARSE SAND.

1) PORE PRESSURE DISSIPATION TEST PERFORMED AT 12.1 FEET AND 18.0 FEET BELOW EXISTING GROUND SURFACE.

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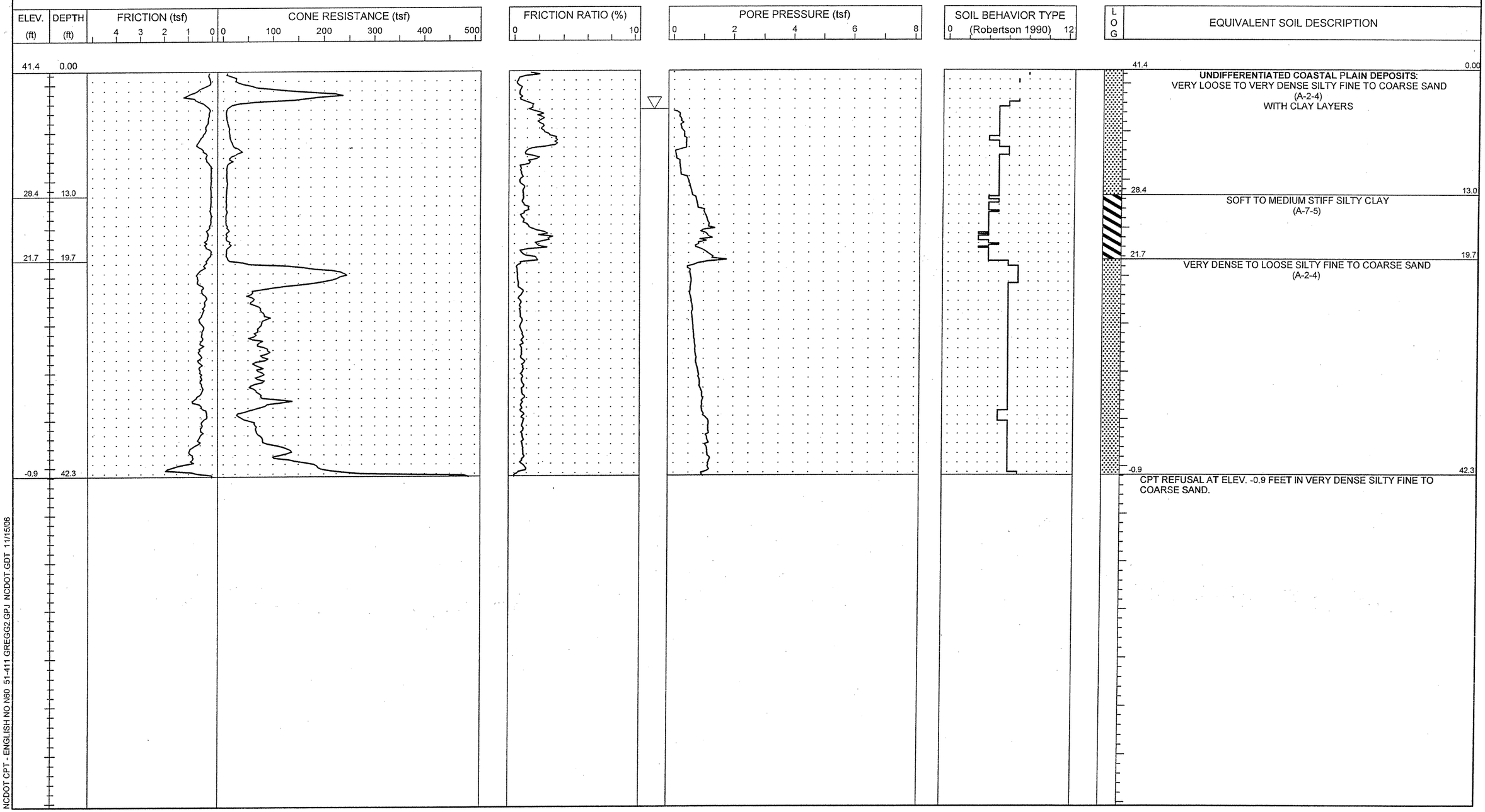
BORING LOG

SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 42.3 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-62	**BORING LOCATION** 152+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/27/06	**COMPLETED** 10/27/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 41.4 ft	**NORTHING** 194,138.7	**EASTING** 2,284,268.7		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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BORING LOG

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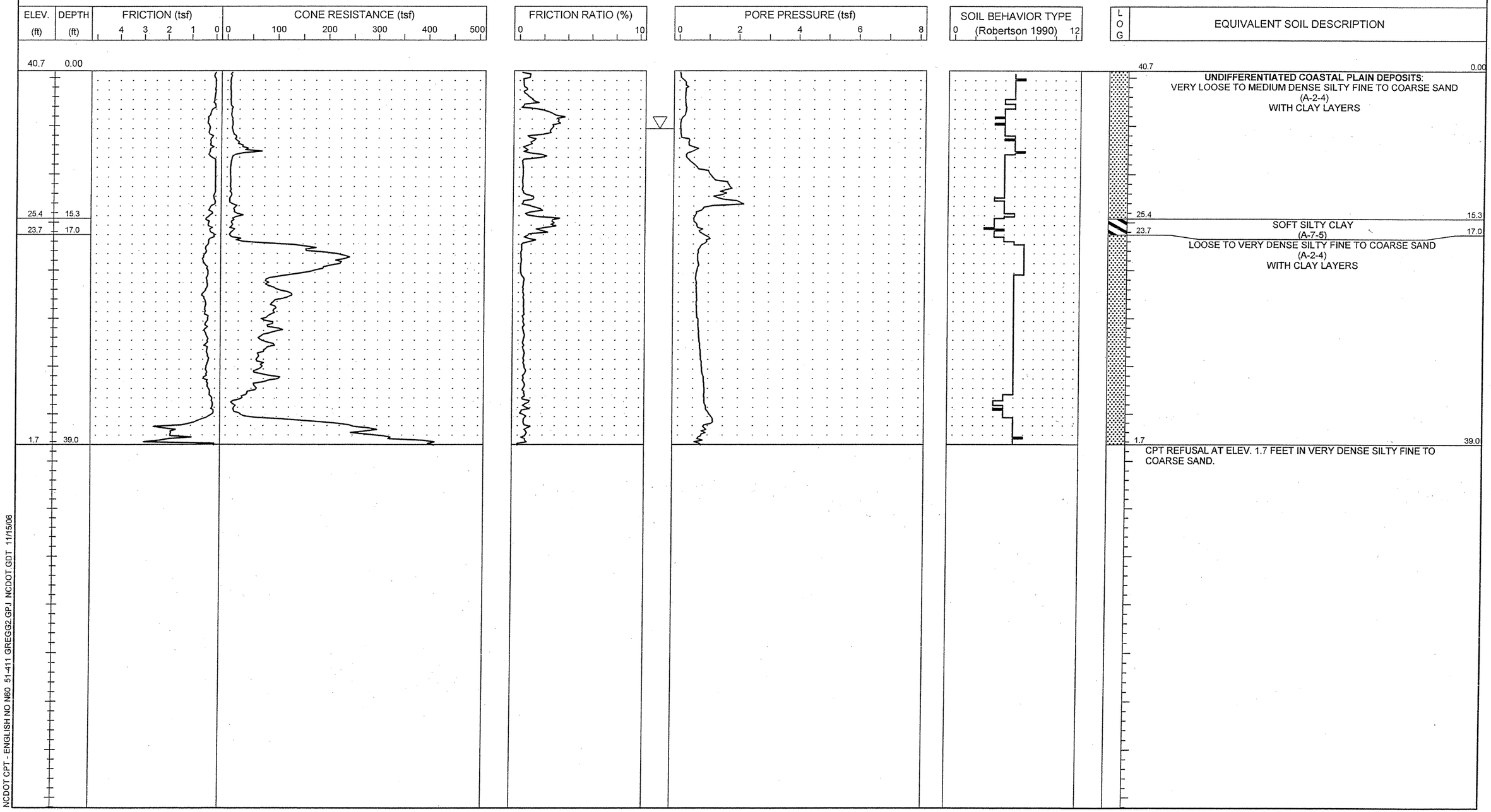
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 39.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-63	**BORING LOCATION** 154+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 6.0	**DATE STARTED** 10/27/06	**COMPLETED** 10/27/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.7 ft	**NORTHING** 194,130.3	**EASTING** 2,284,468.5		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



EQUIVALENT SOIL DESCRIPTION

40.7 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

25.4 — 15.3

23.7 — 17.0

SOFT SILTY CLAY
(A-7-5)

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

1.7 — 39.0

CPT REFUSAL AT ELEV. 1.7 FEET IN VERY DENSE SILTY FINE TO COARSE SAND.

NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 11/15/06

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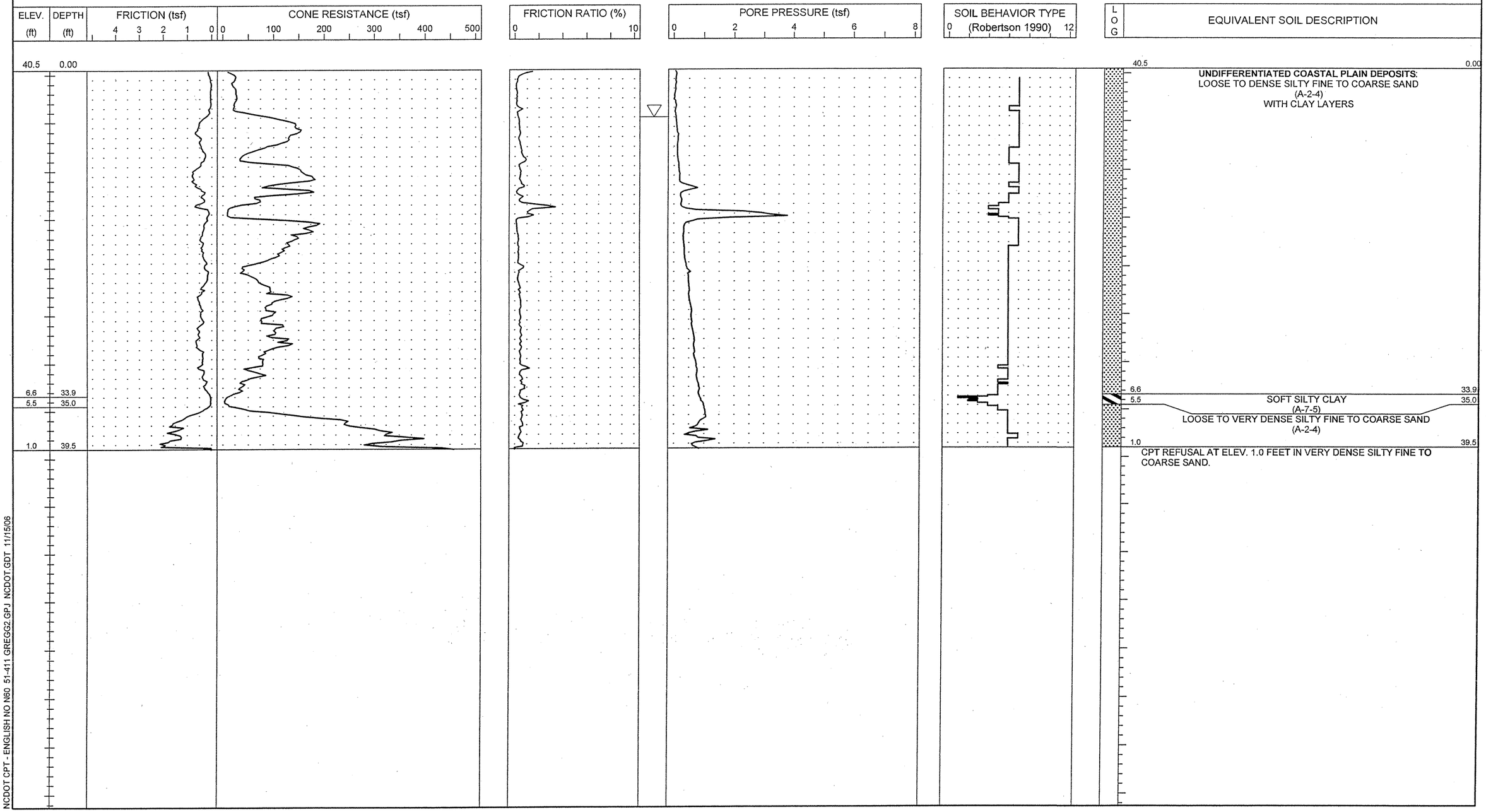
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 39.5 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-64	**BORING LOCATION** 156+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 5.0	**DATE STARTED** 10/27/06	**COMPLETED** 10/27/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.5 ft	**NORTHING** 194,114.9	**EASTING** 2,284,667.9		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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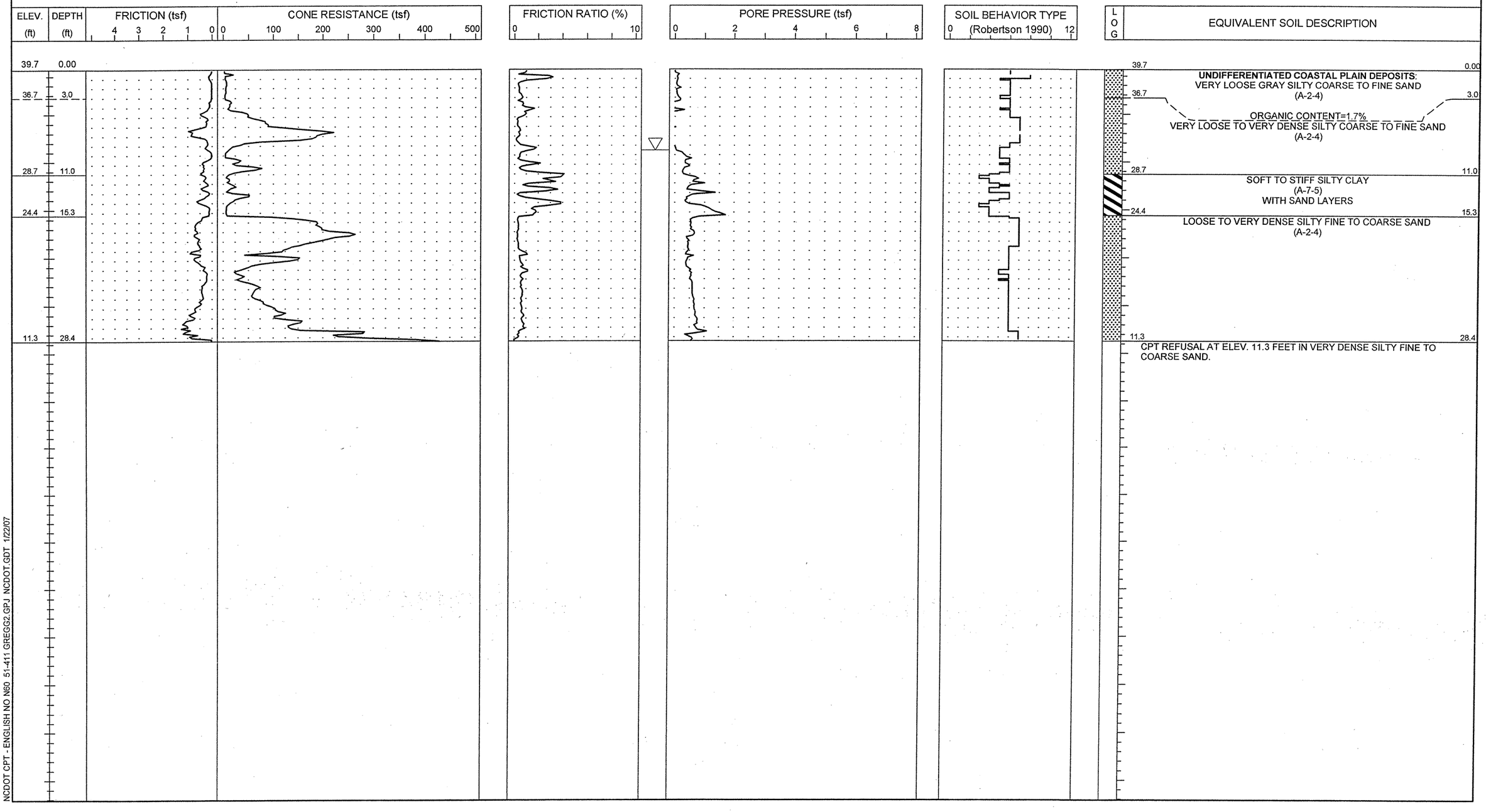
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 28.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-65	**BORING LOCATION** 158+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.5	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 39.7 ft	**NORTHING** 194,092.5	**EASTING** 2,284,866.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



LOG

39.7 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE GRAY SILTY COARSE TO FINE SAND
(A-2-4)

36.7 3.0

ORGANIC CONTENT=1.7%
VERY LOOSE TO VERY DENSE SILTY COARSE TO FINE SAND
(A-2-4)

28.7 11.0

SOFT TO STIFF SILTY CLAY
(A-7-5)
WITH SAND LAYERS

24.4 15.3

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)

11.3 28.4

CPT REFUSAL AT ELEV. 11.3 FEET IN VERY DENSE SILTY FINE TO COARSE SAND.

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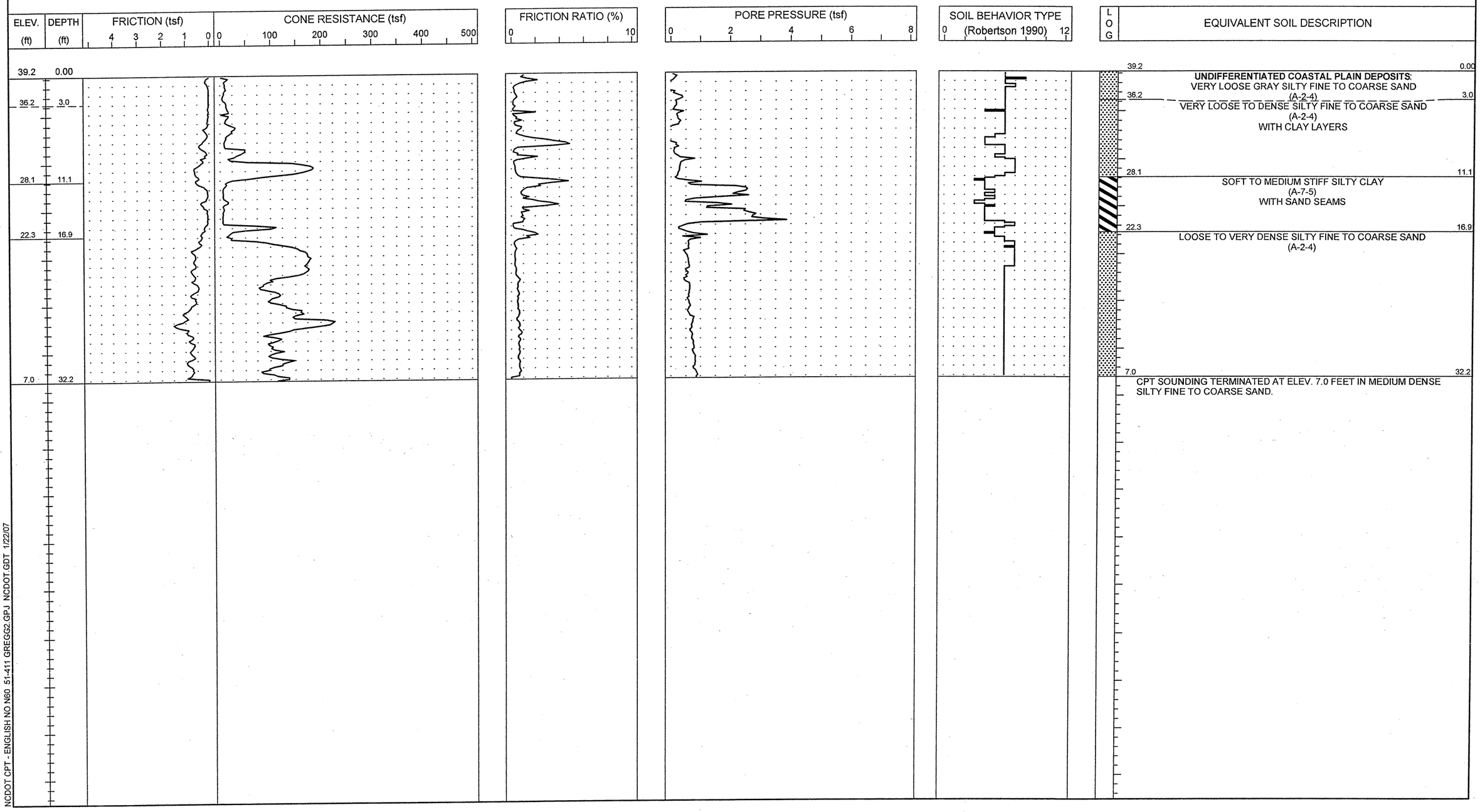
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 32.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-66	**BORING LOCATION** 160+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 39.2 ft	**NORTHING** 194,063.3	**EASTING** 2,285,064.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



LOG

39.2 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE GRAY SILTY FINE TO COARSE SAND
(A-2-4)

36.2 3.0

VERY LOOSE TO DENSE SILTY FINE TO COARSE SAND
(A-2-4)
WITH CLAY LAYERS

28.1 11.1

SOFT TO MEDIUM STIFF SILTY CLAY
(A-7-5)
WITH SAND SEAMS

22.3 16.9

LOOSE TO VERY DENSE SILTY FINE TO COARSE SAND
(A-2-4)

7.0 32.2

CPT SOUNDING TERMINATED AT ELEV. 7.0 FEET IN MEDIUM DENSE SILTY FINE TO COARSE SAND.

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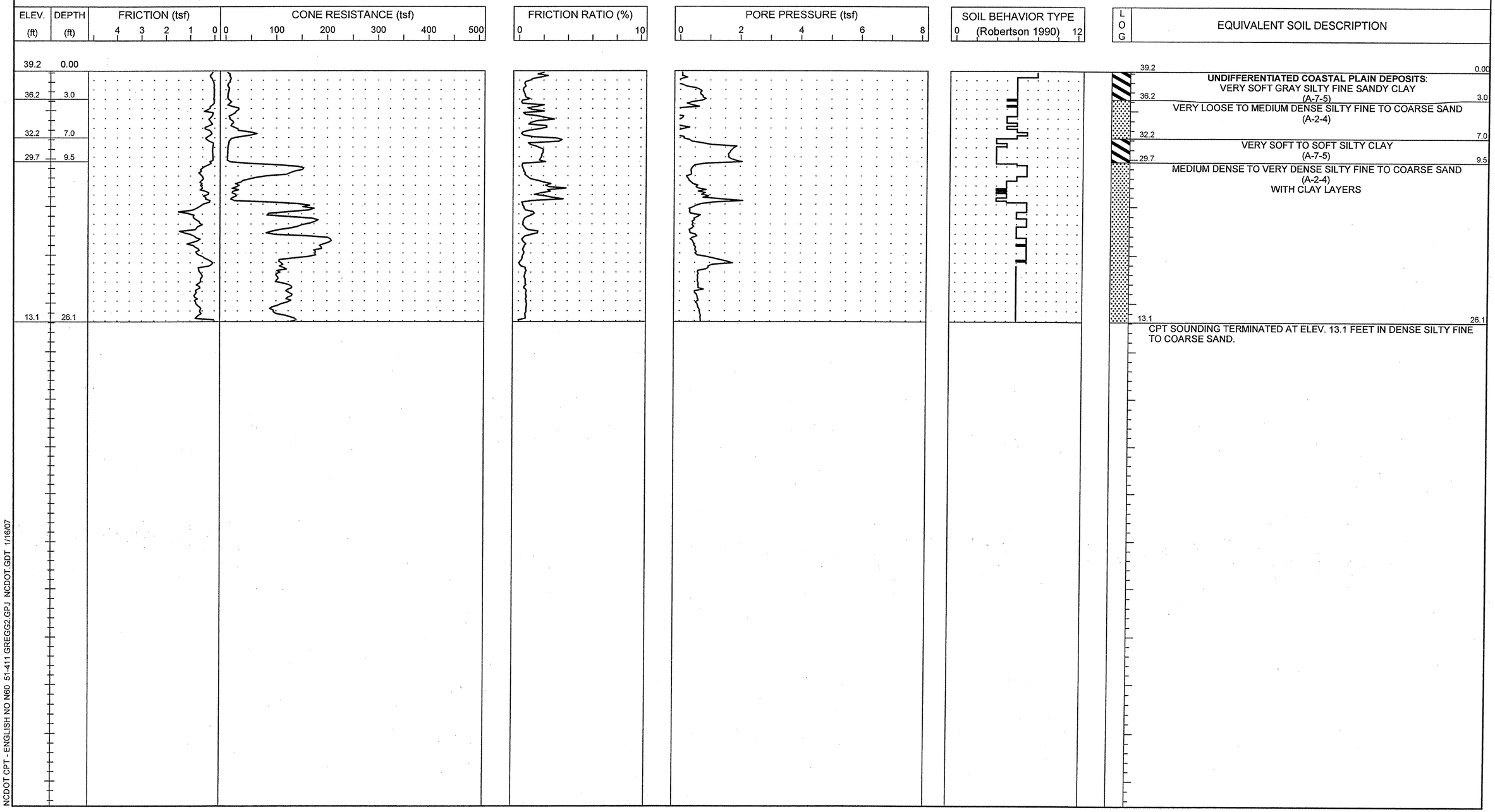
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 26.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-67	**BORING LOCATION** 162+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 39.2 ft	**NORTHING** 194,027.2	**EASTING** 2,285,261.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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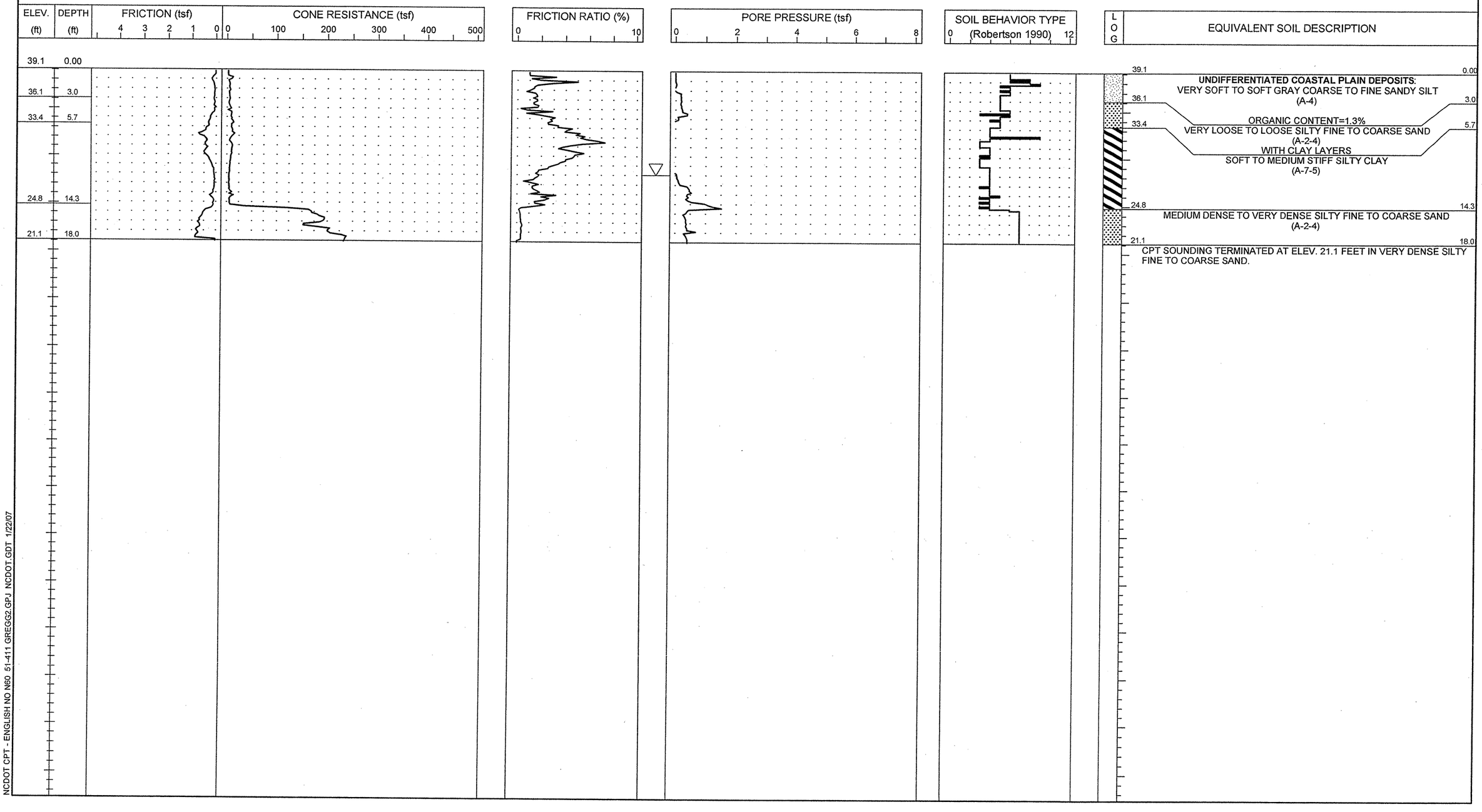
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-68	**BORING LOCATION** 164+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 11.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 39.1 ft	**NORTHING** 193,984.3	**EASTING** 2,285,456.5	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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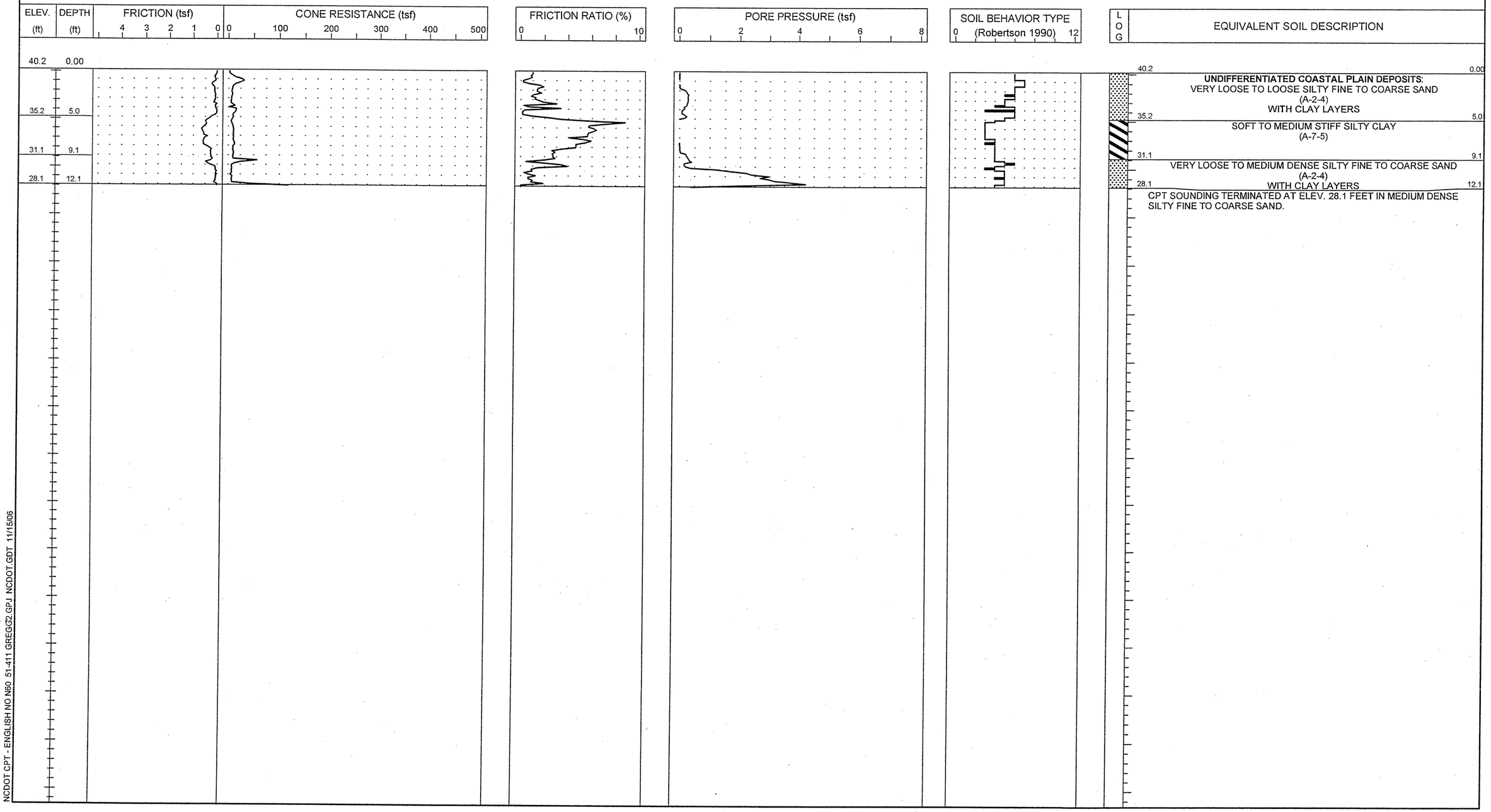
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 12.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-69	**BORING LOCATION** 166+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 40.2 ft	**NORTHING** 193,934.6	**EASTING** 2,285,650.2		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



NCDOT CPT - ENGLISH NO N60 51-411 GREGG2.GPJ NCDOT.GDT 11/15/06

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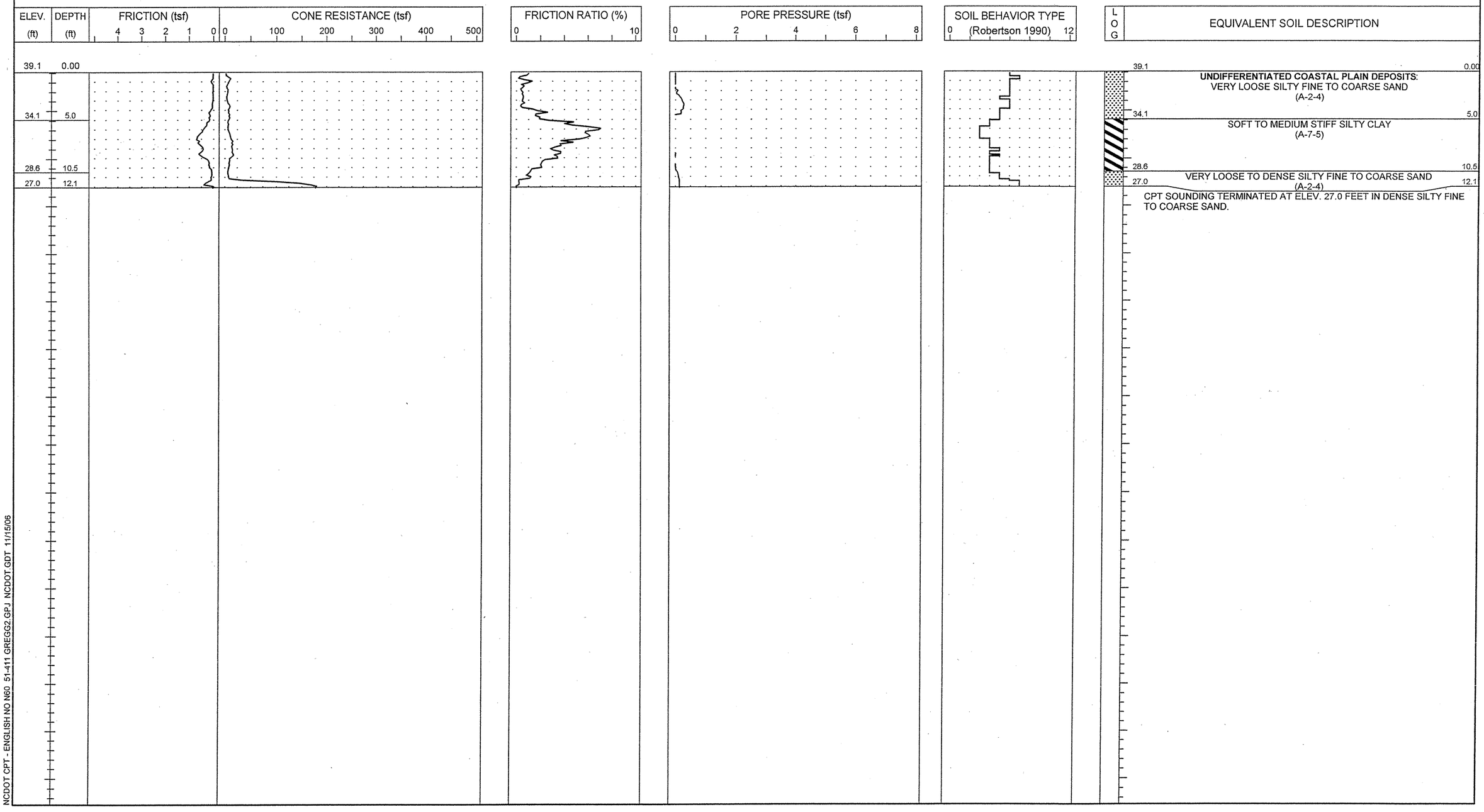
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 12.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-70	**BORING LOCATION** 168+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 39.1 ft	**NORTHING** 193,879.4	**EASTING** 2,285,842.4		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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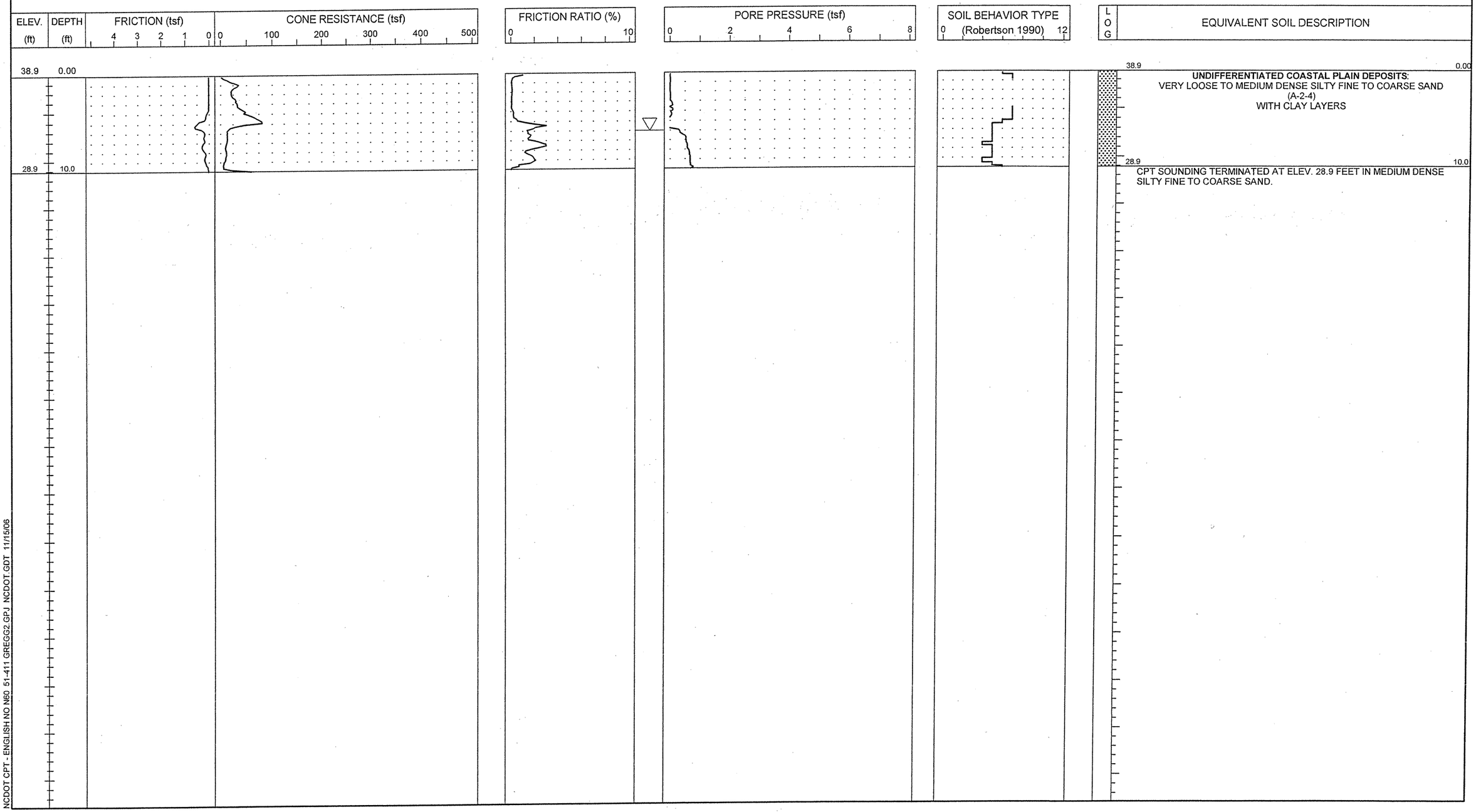
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-72	**BORING LOCATION** 172+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 6.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 38.9 ft	**NORTHING** 193,766.0	**EASTING** 2,286,226.0		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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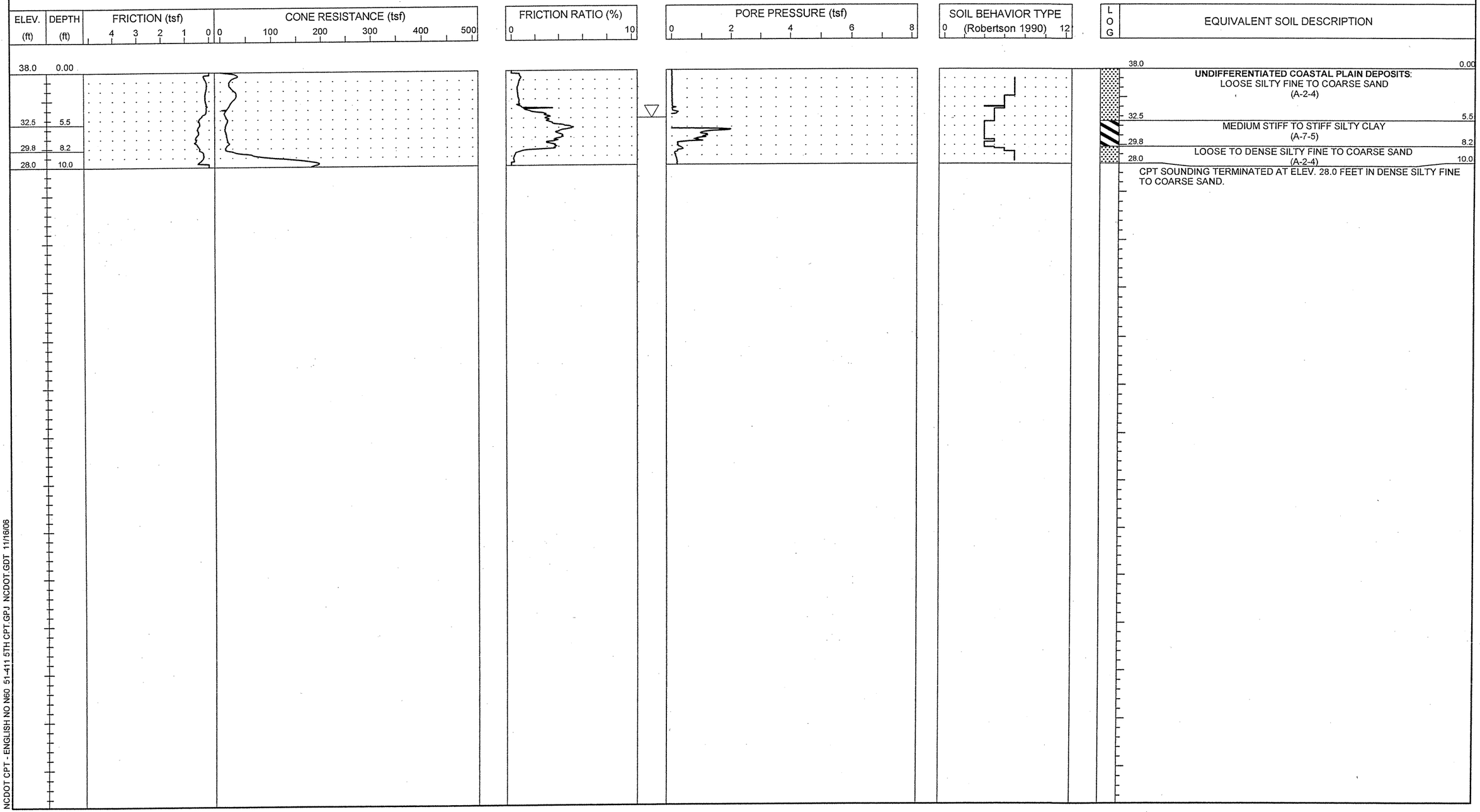
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-73	**BORING LOCATION** 174+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 5.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 38.0 ft	**NORTHING** 193,709.3	**EASTING** 2,286,417.8		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



LOG

EQUIVALENT SOIL DESCRIPTION

38.0 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
LOOSE SILTY FINE TO COARSE SAND
(A-2-4)

32.5 — 5.5

MEDIUM STIFF TO STIFF SILTY CLAY
(A-7-5)

29.8 — 8.2

LOOSE TO DENSE SILTY FINE TO COARSE SAND
(A-2-4)

28.0 — 10.0

CPT SOUNDING TERMINATED AT ELEV. 28.0 FEET IN DENSE SILTY FINE TO COARSE SAND.

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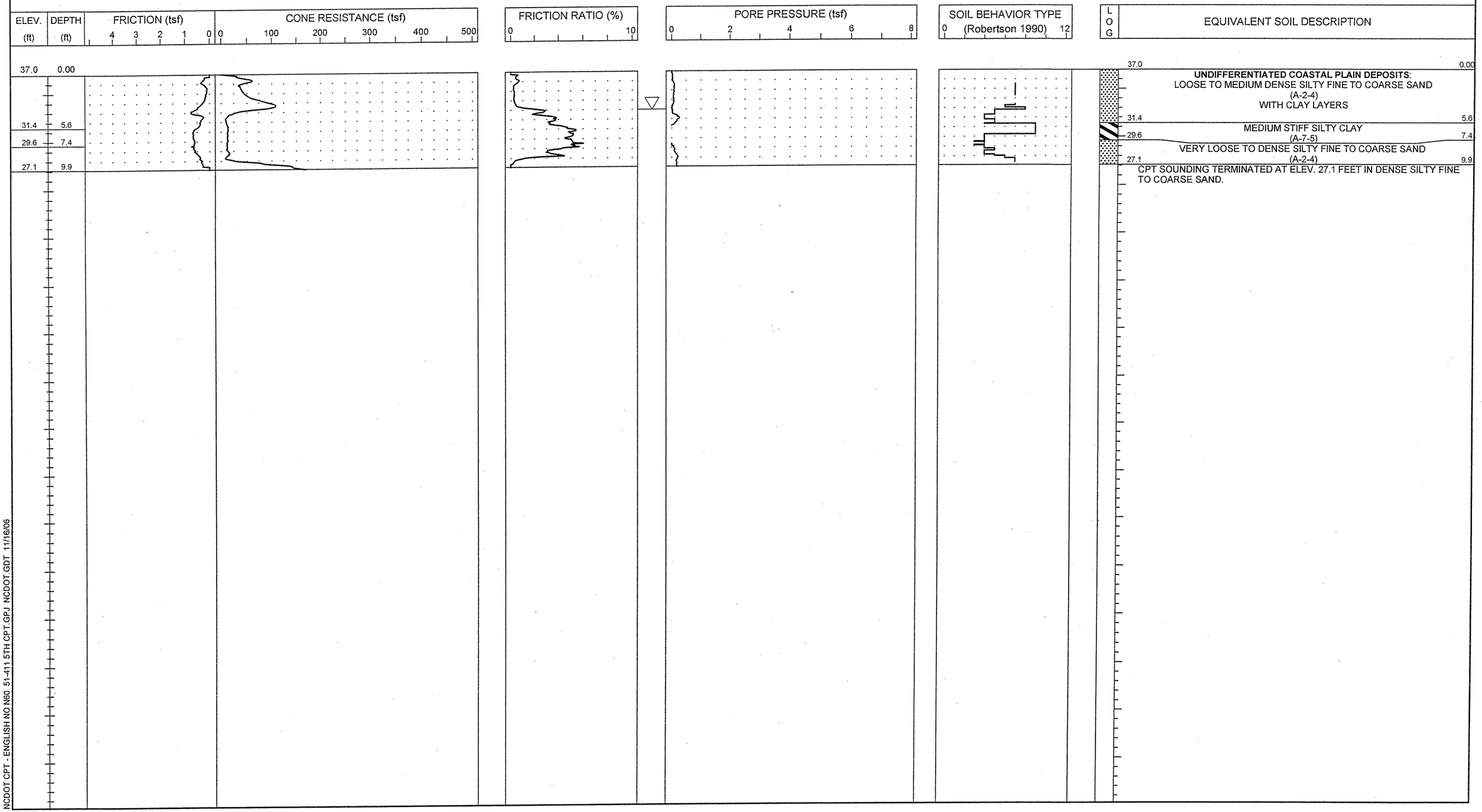
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 9.9 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-74	**BORING LOCATION** 176+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 37.0 ft	**NORTHING** 193,652.6	**EASTING** 2,286,609.6		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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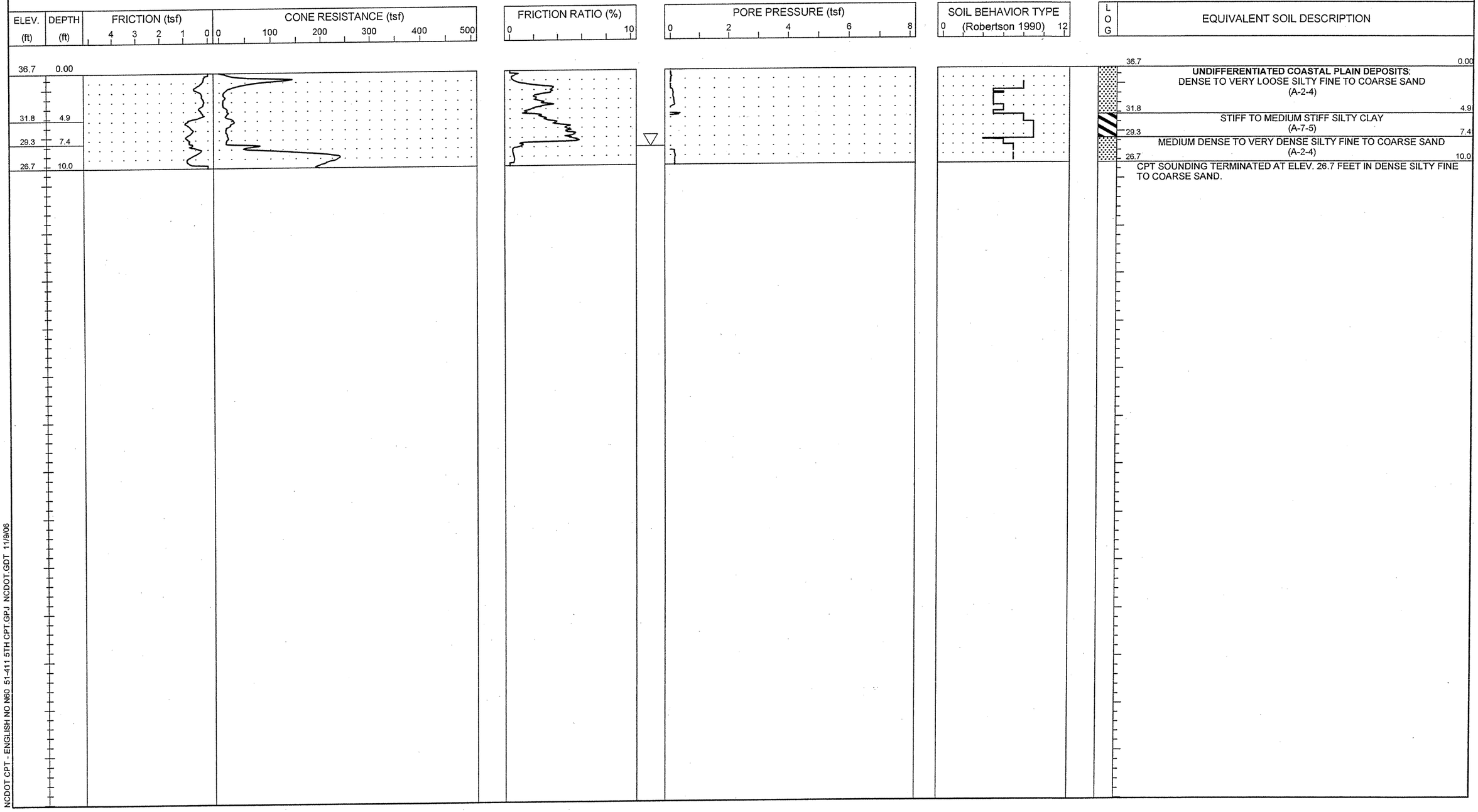
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-75	**BORING LOCATION** 178+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 36.7 ft	**NORTHING** 193,595.9	**EASTING** 2,286,801.4		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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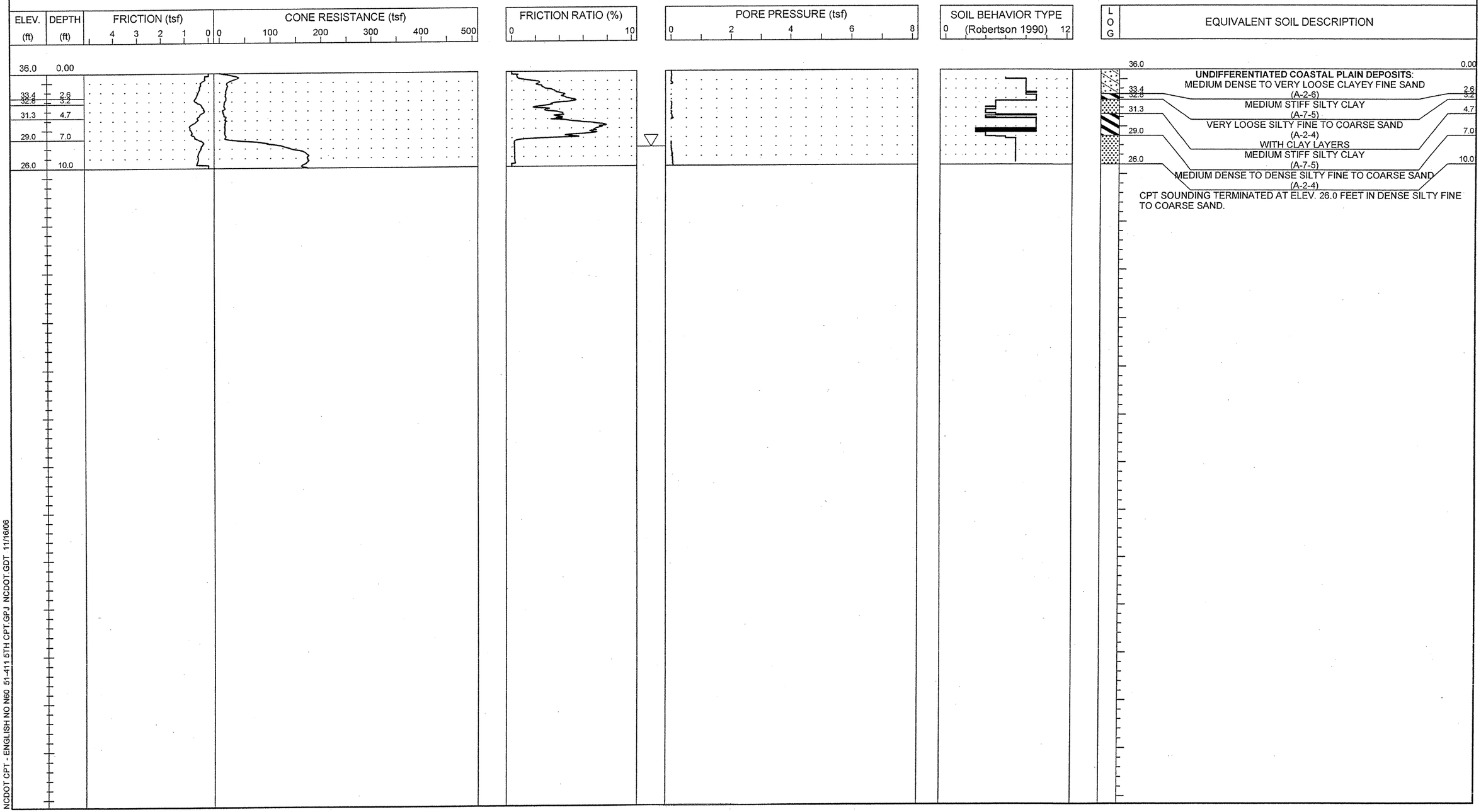
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-76	**BORING LOCATION** 180+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 36.0 ft	**NORTHING** 193,539.2	**EASTING** 2,286,993.2		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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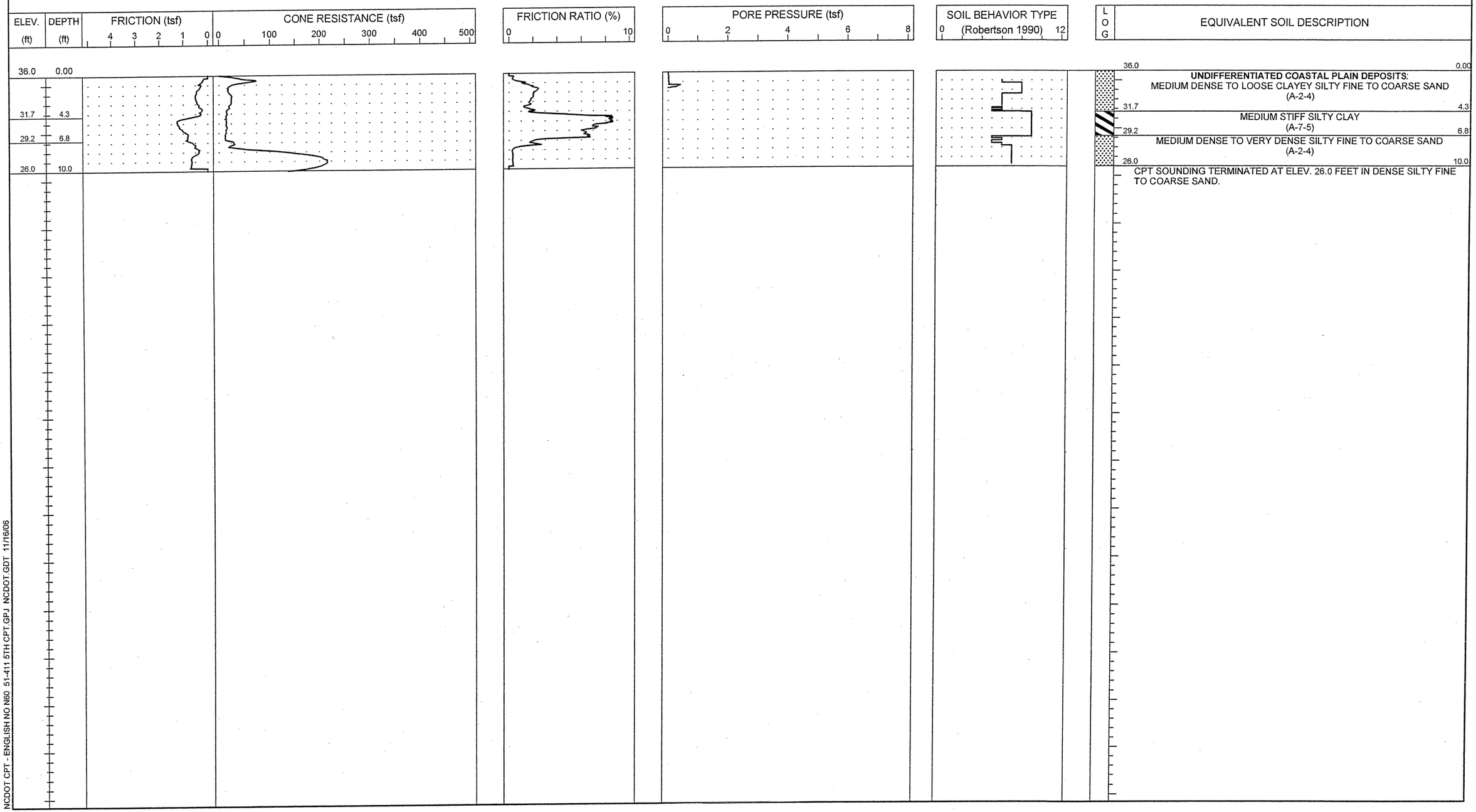
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-77	**BORING LOCATION** 182+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 36.0 ft	**NORTHING** 193,482.5	**EASTING** 2,287,185.0		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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BORING LOG

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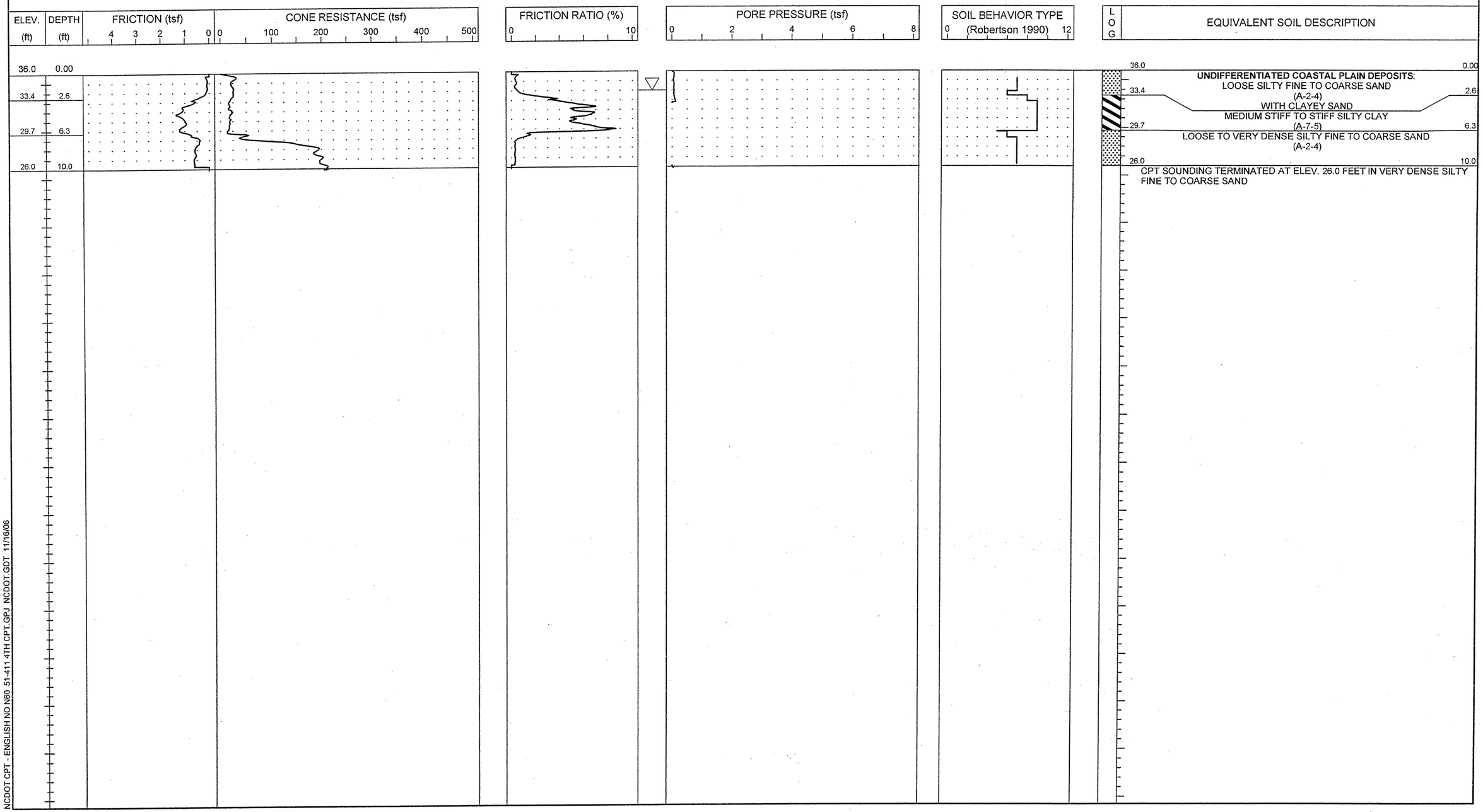
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 10.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-78	**BORING LOCATION** 184+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 36.0 ft	**NORTHING** 193,425.8	**EASTING** 2,287,376.8		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



NCDOT CPT - ENGLISH NO N60 51-411 4TH CPT.GPJ NCDOT.GDT 11/16/06

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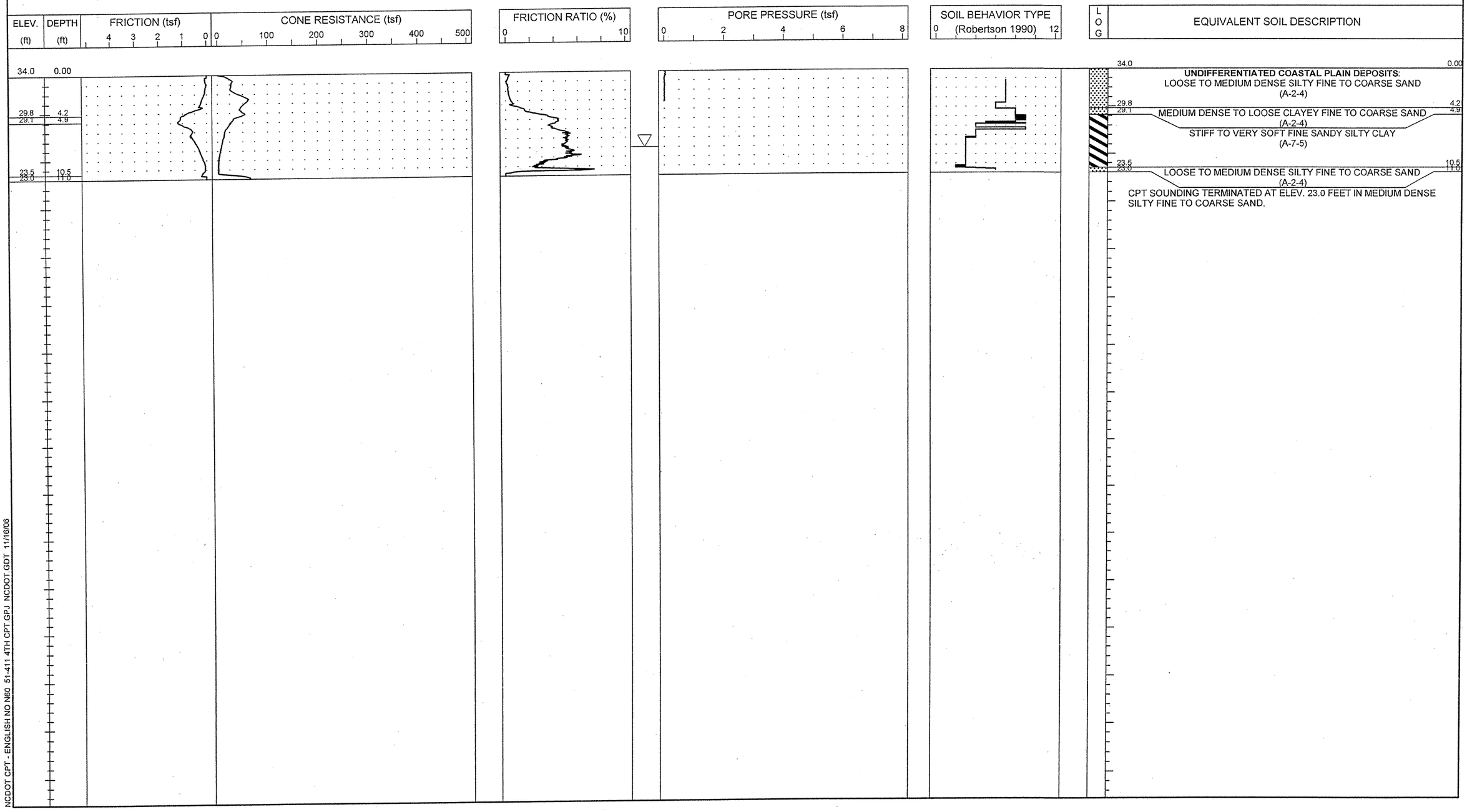
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 11.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-79	**BORING LOCATION** 186+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 8.0	**DATE STARTED**	**COMPLETED**	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 34.0 ft	**NORTHING** 193,369.2	**EASTING** 2,287,568.6		**24 HR.** N/M	**DRILLER:** A. MARTIN	**TECHNICIAN** J. WALKER	



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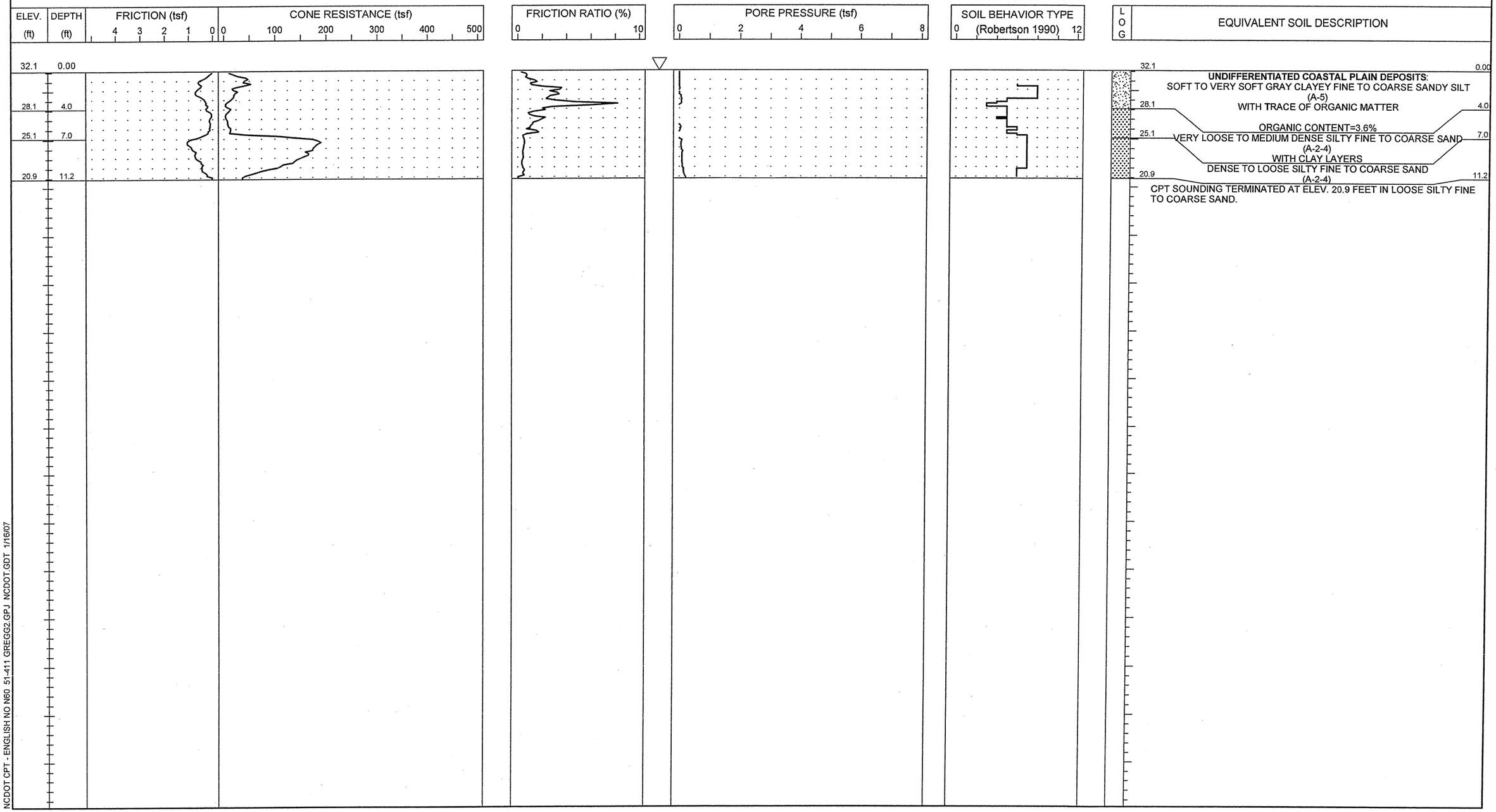
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 11.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-80	**BORING LOCATION** 188+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 32.1 ft	**NORTHING** 193,312.5	**EASTING** 2,287,760.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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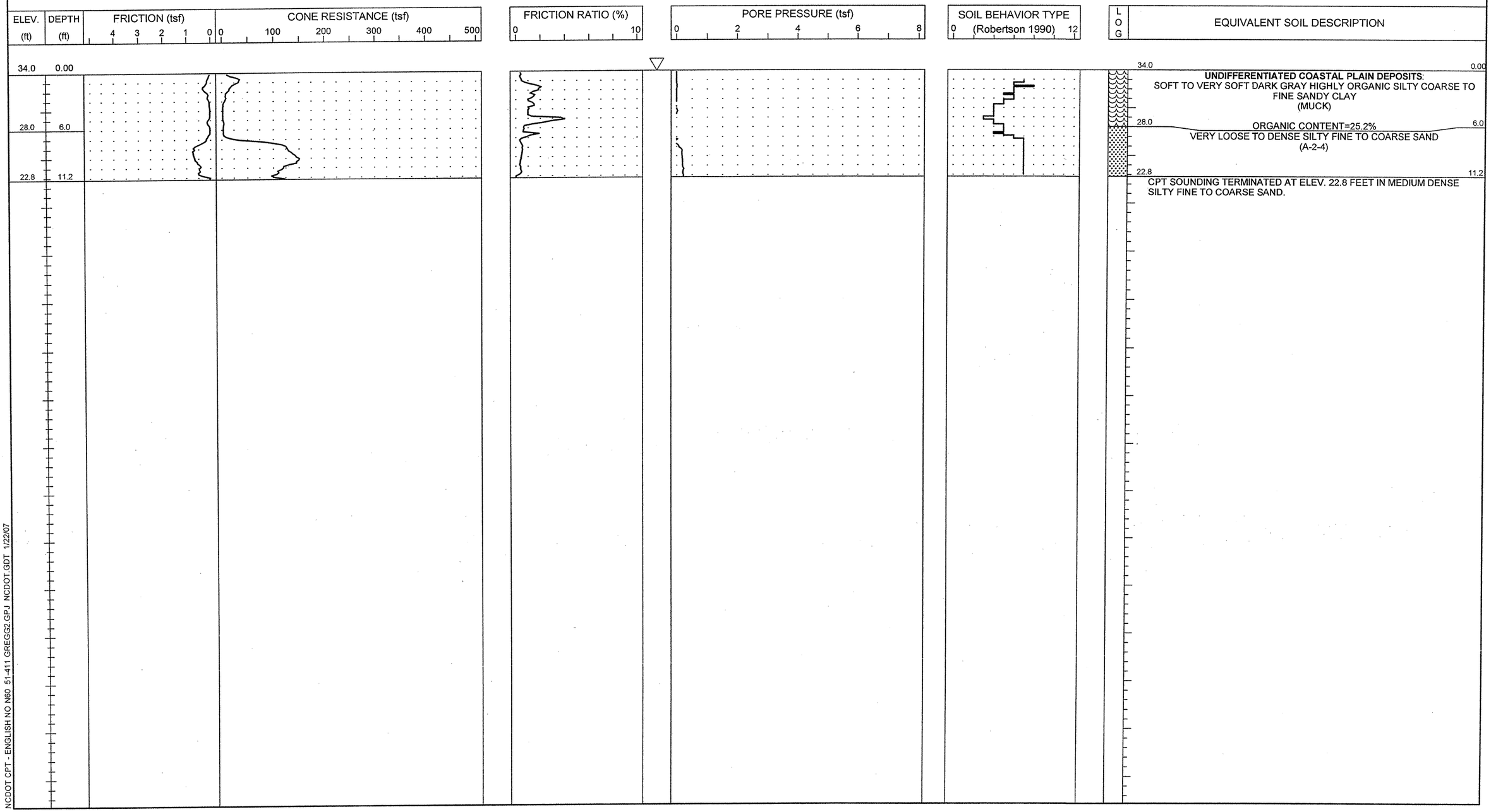
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 11.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-81	**BORING LOCATION** 190+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 34.0 ft	**NORTHING** 193,255.8	**EASTING** 2,287,952.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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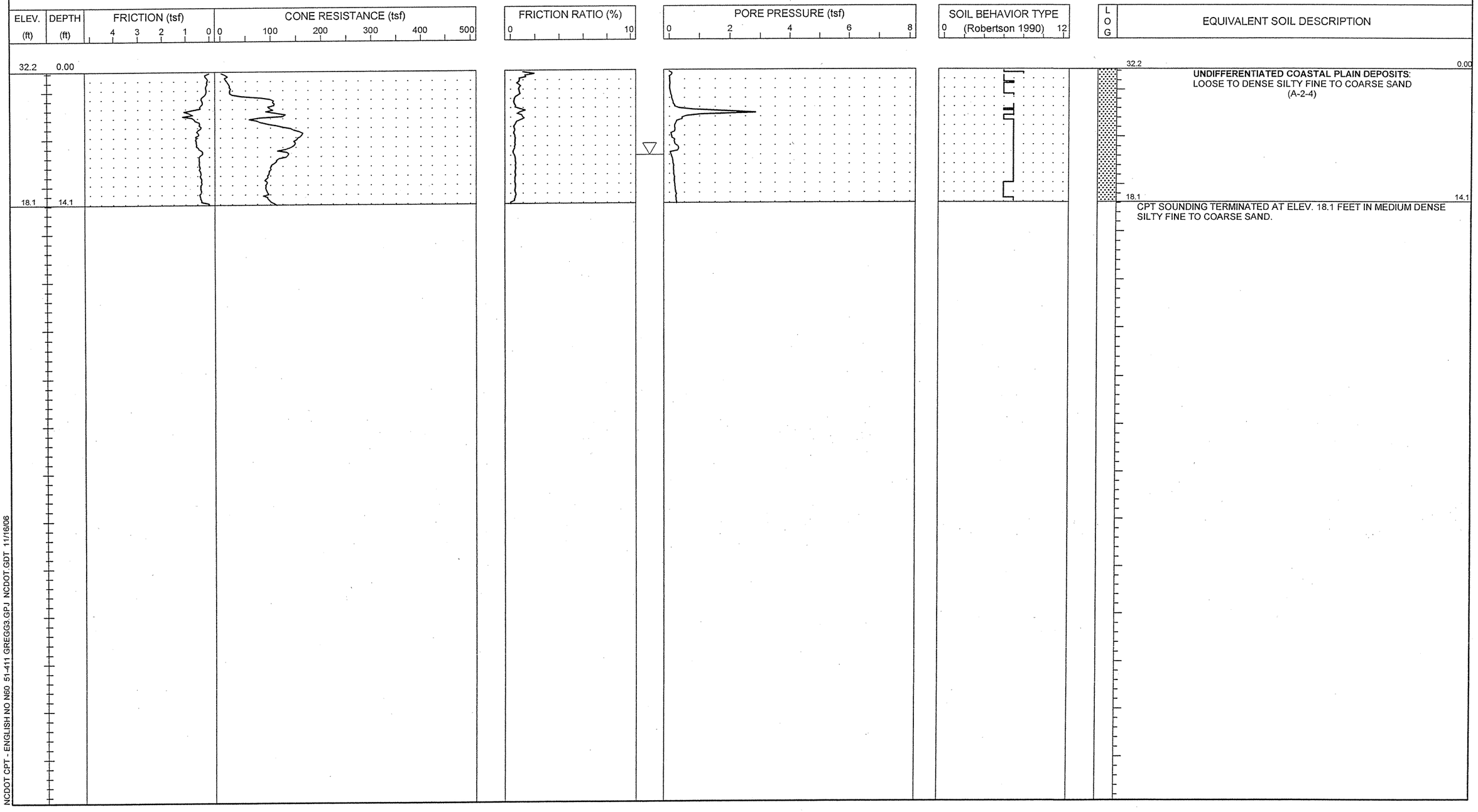
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 82	**BORING LOCATION** 192+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 9.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 32.2 ft	**NORTHING** 193,199.1	**EASTING** 2,288,144.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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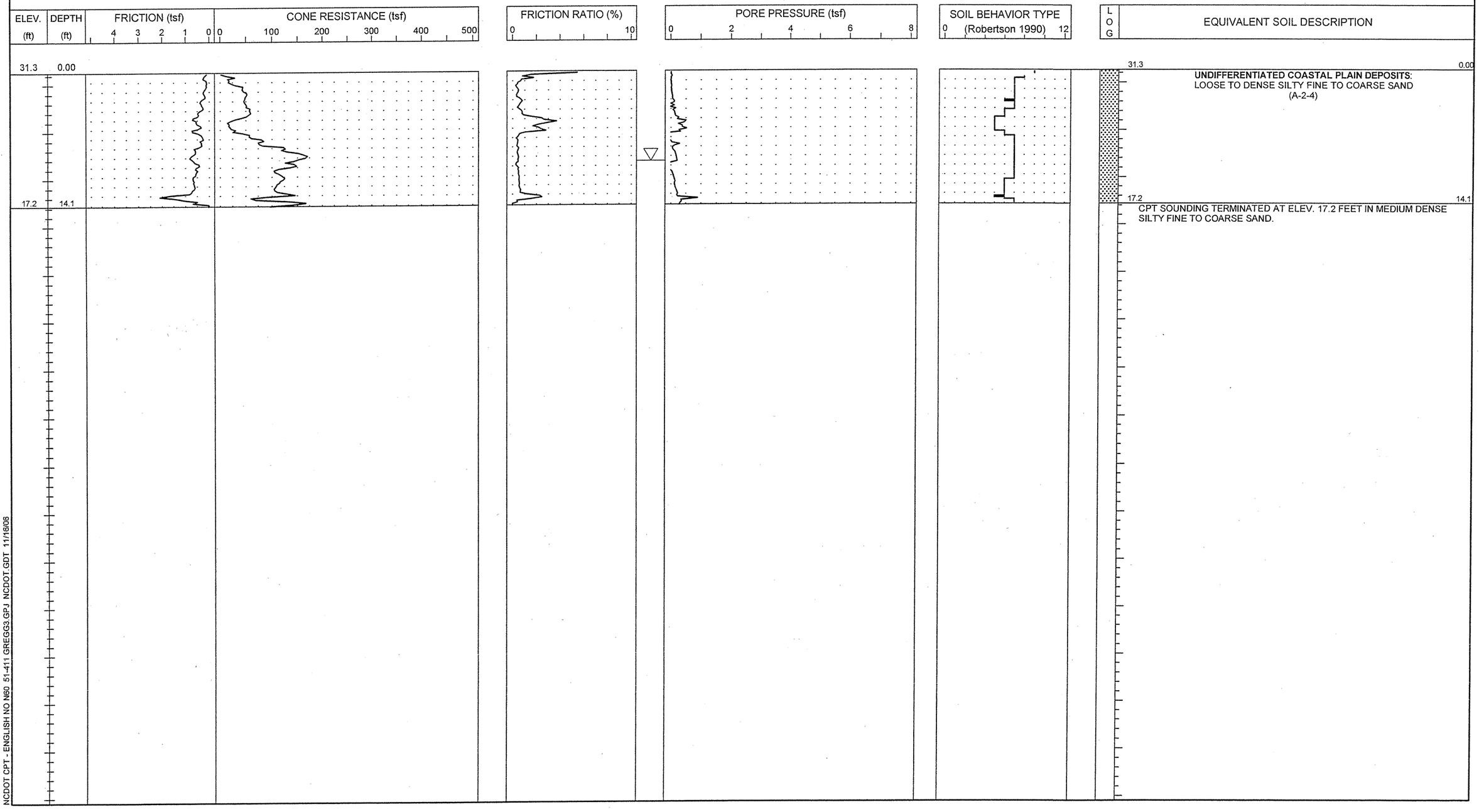
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 83	**BORING LOCATION** 194+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 9.5	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 31.3 ft	**NORTHING** 193,142.4	**EASTING** 2,288,335.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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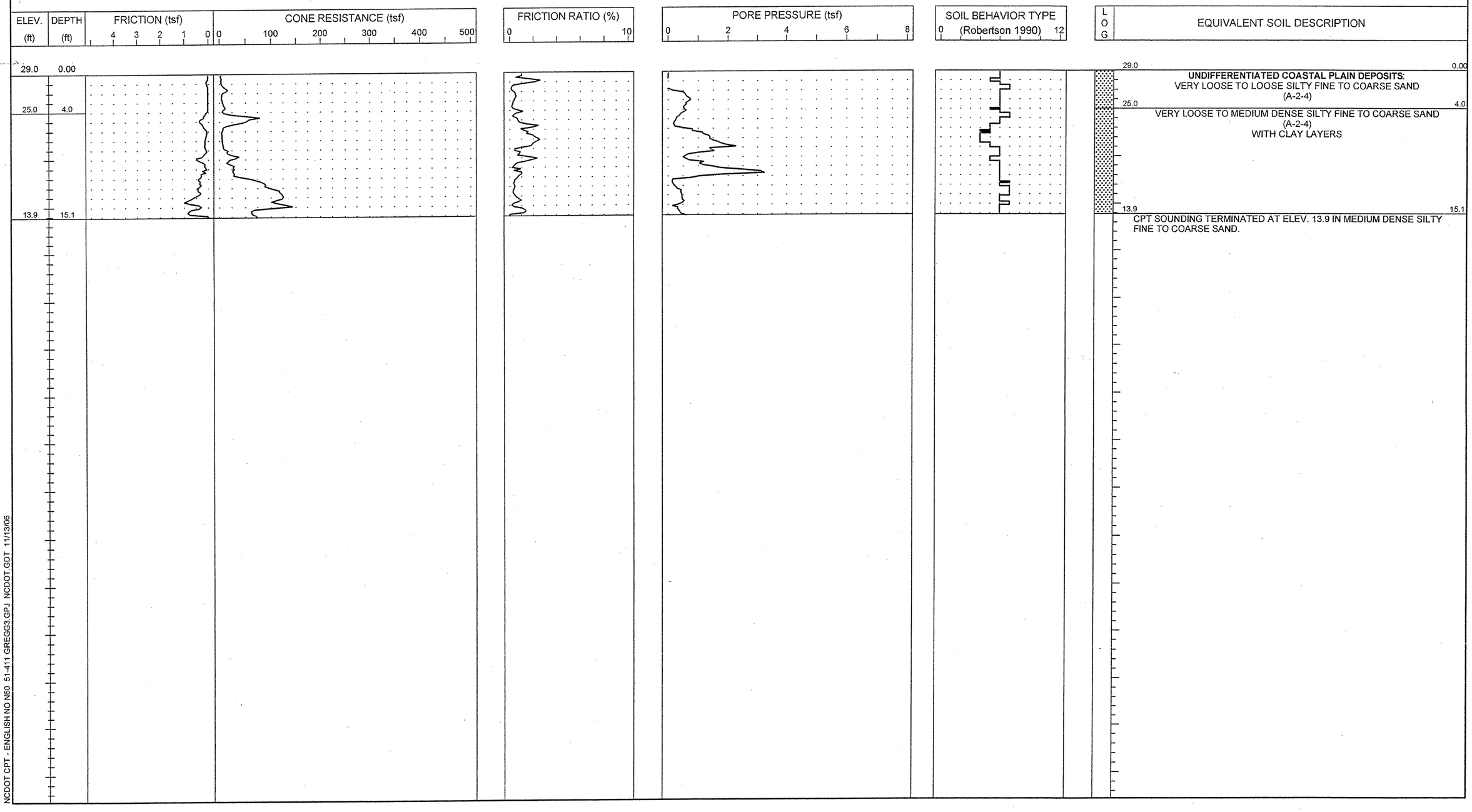
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-84	**BORING LOCATION** 196+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 29.0 ft	**NORTHING** 193,085.7	**EASTING** 2,288,527.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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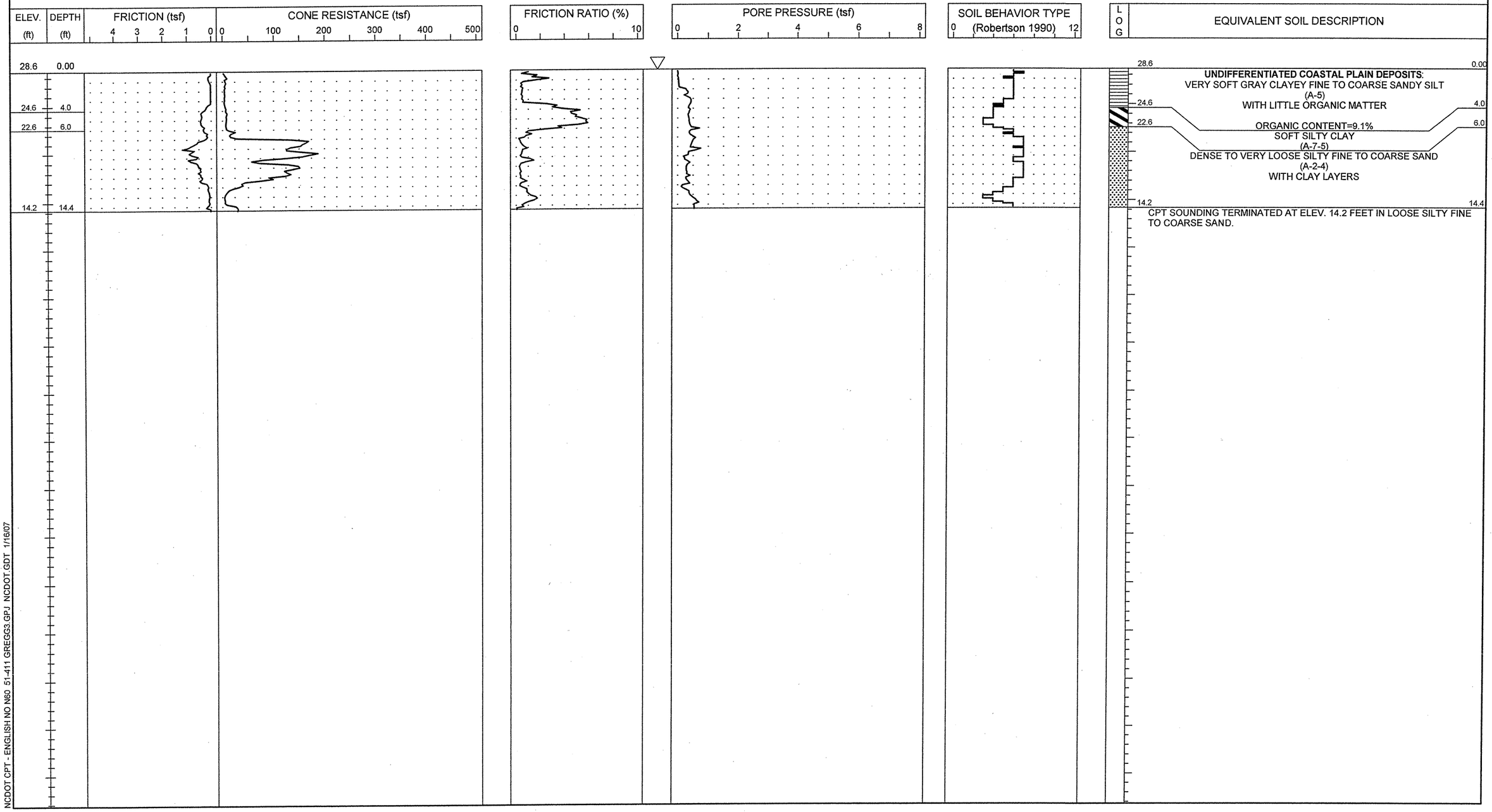
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.4 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 85	**BORING LOCATION** 198+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 28.6 ft	**NORTHING** 193,029.0	**EASTING** 2,288,719.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60 51-411 GREGG3.GPJ NCDOT.GDT 1/16/07

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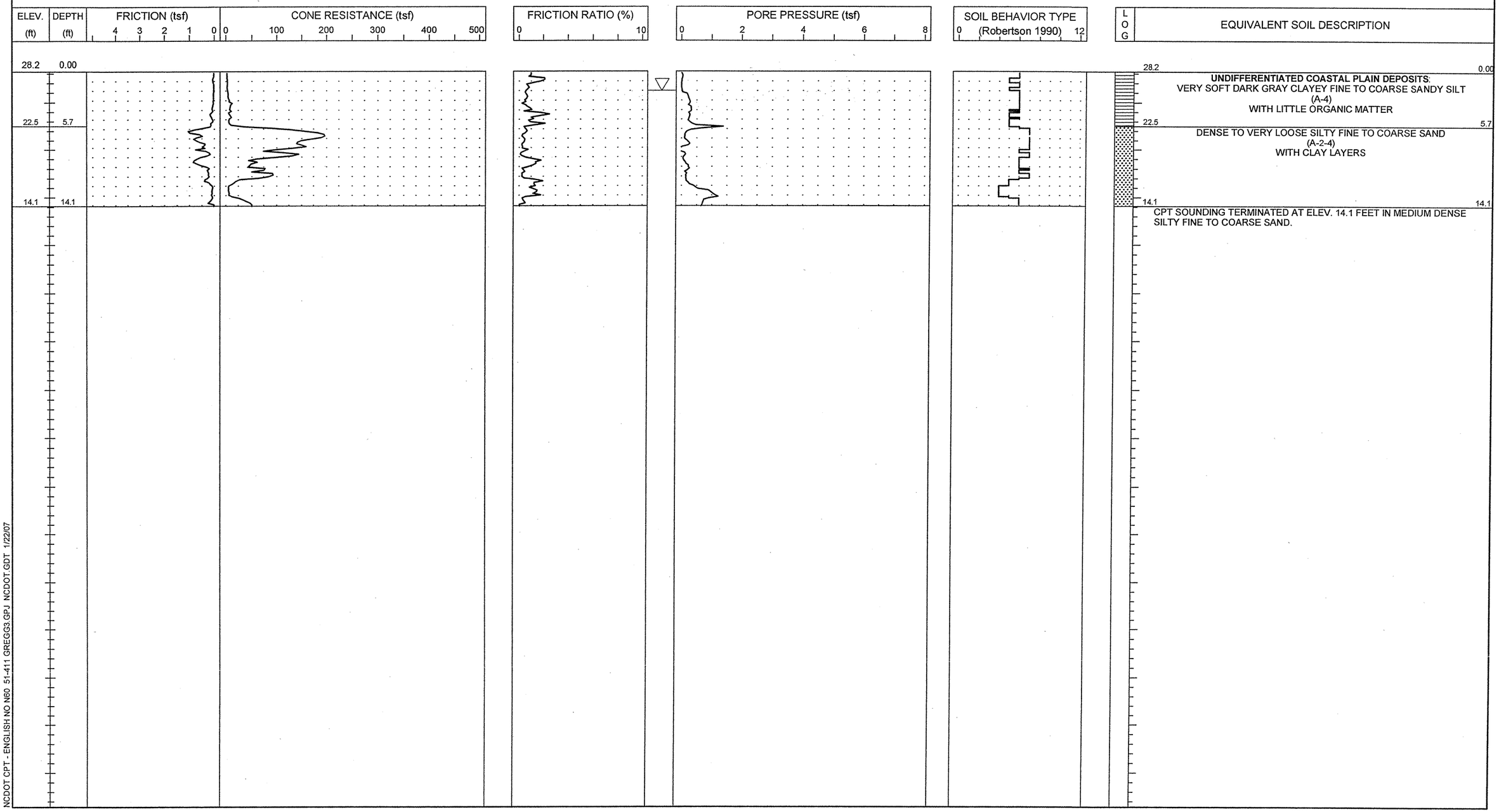
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 86	**BORING LOCATION** 200+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 28.2 ft	**NORTHING** 192,972.3	**EASTING** 2,288,911.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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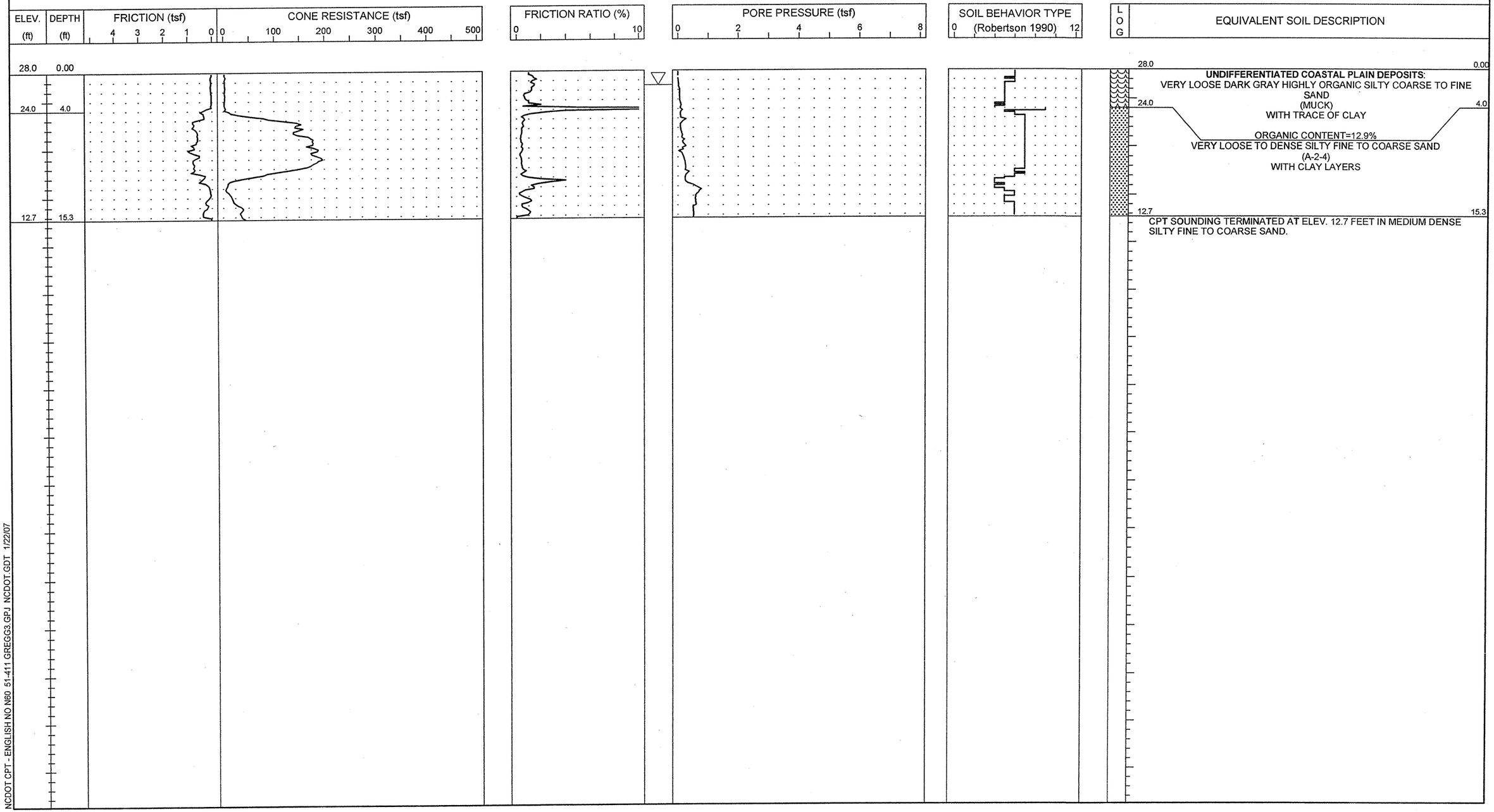
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.3 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 87	**BORING LOCATION** 202+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.5	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 28.0 ft	**NORTHING** 192,915.6	**EASTING** 2,289,103.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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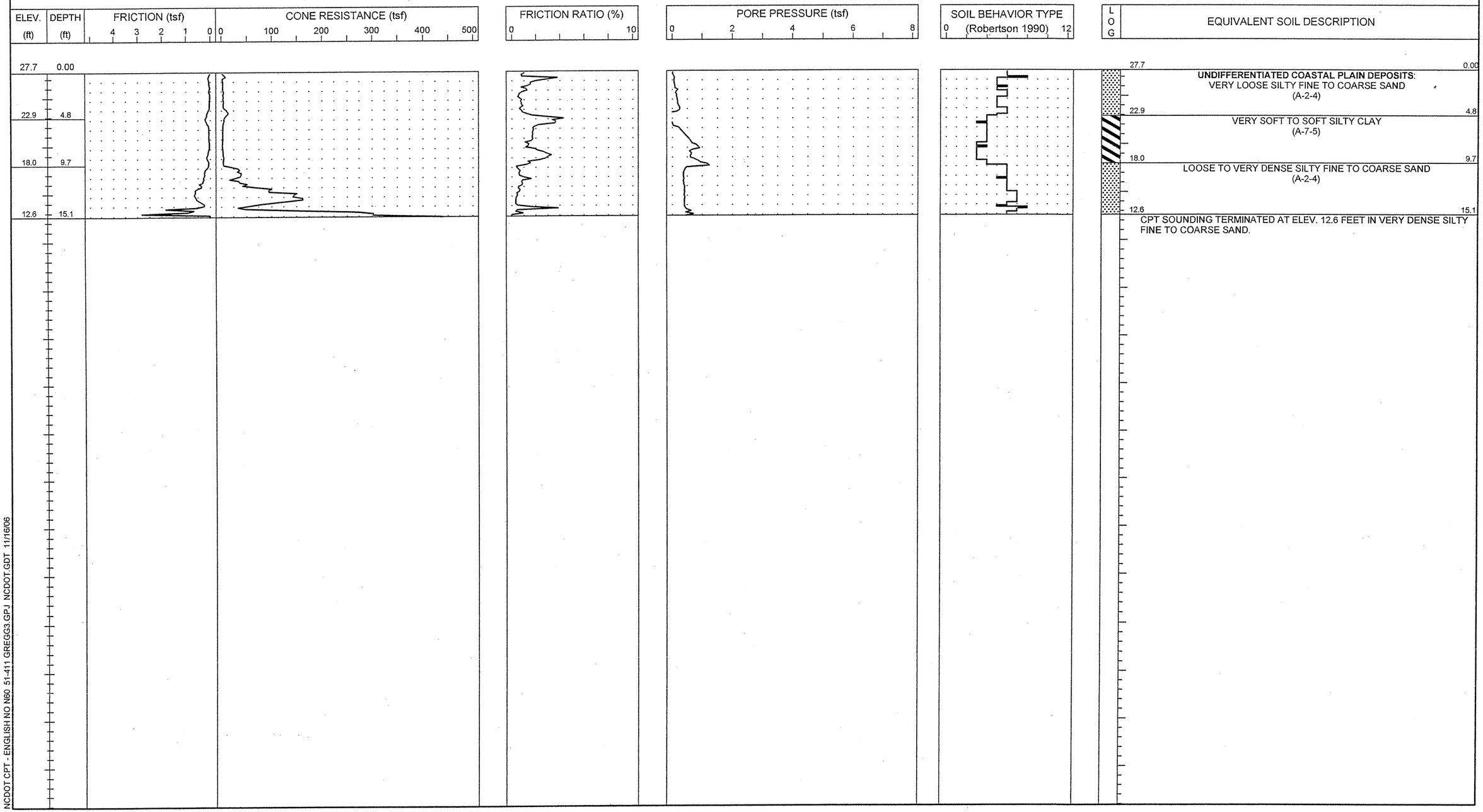
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 88	**BORING LOCATION** 204+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.7 ft	**NORTHING** 192,858.9	**EASTING** 2,289,294.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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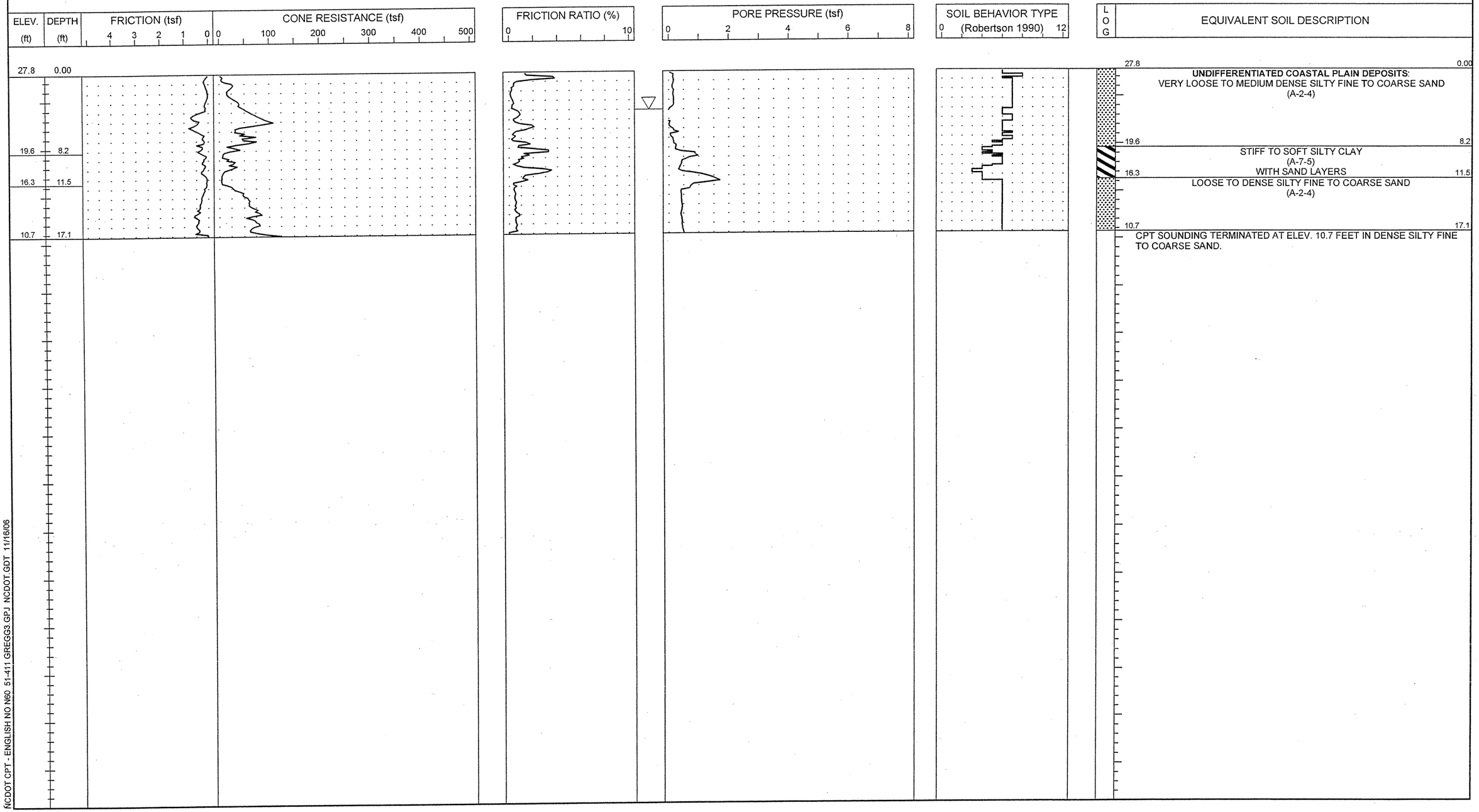
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 89	**BORING LOCATION** 206+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 4.0	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.8 ft	**NORTHING** 192,802.2	**EASTING** 2,289,486.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



27.8 / 0.00 — **UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:** VERY LOOSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND (A-2-4)

19.6 / 8.2 — STIFF TO SOFT SILTY CLAY (A-7-5) WITH SAND LAYERS

16.3 / 11.5 — LOOSE TO DENSE SILTY FINE TO COARSE SAND (A-2-4)

10.7 / 17.1 — CPT SOUNDING TERMINATED AT ELEV. 10.7 FEET IN DENSE SILTY FINE TO COARSE SAND.

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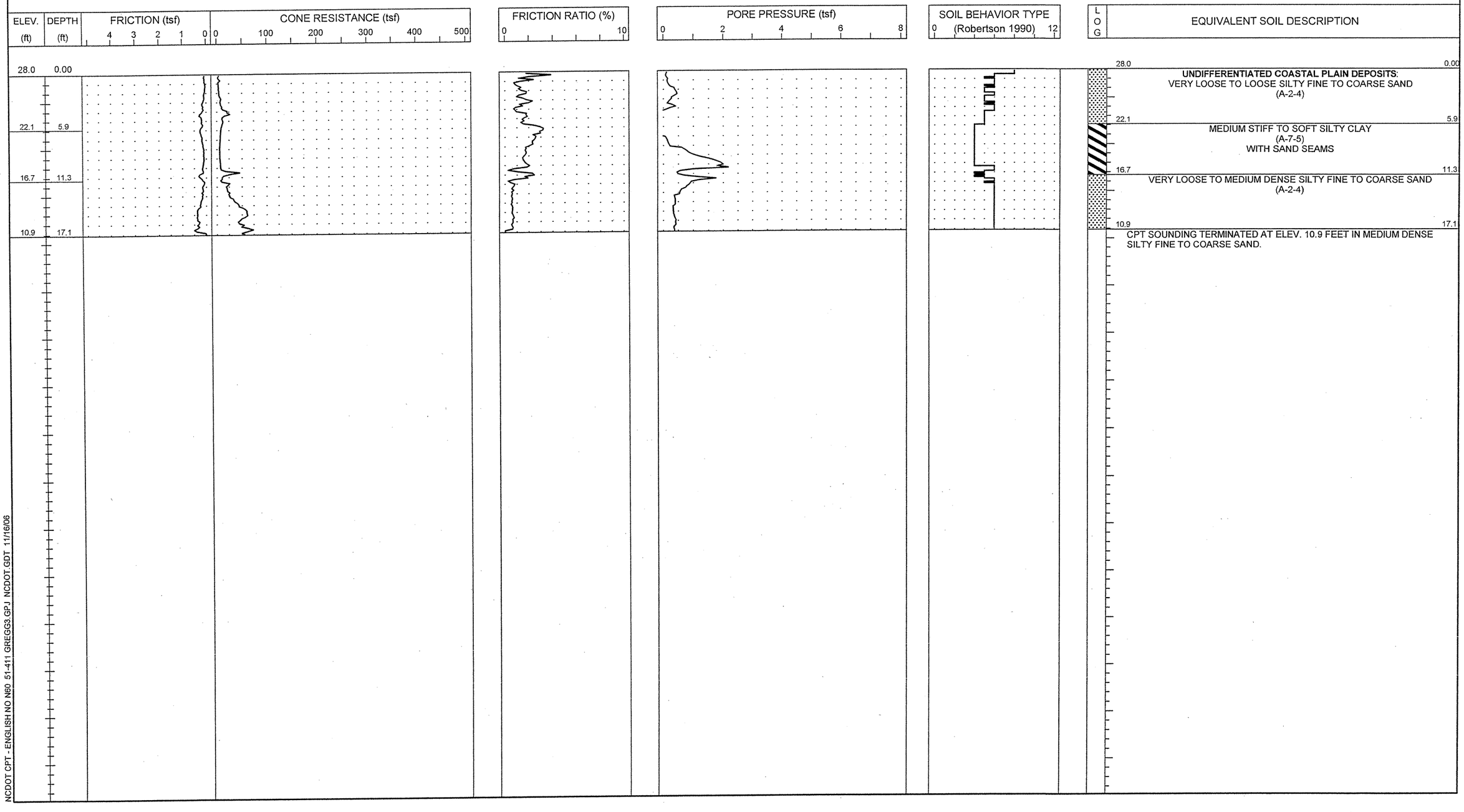
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 90	**BORING LOCATION** 208+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/26/06	**COMPLETED** 10/26/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 28.0 ft	**NORTHING** 192,745.5	**EASTING** 2,289,678.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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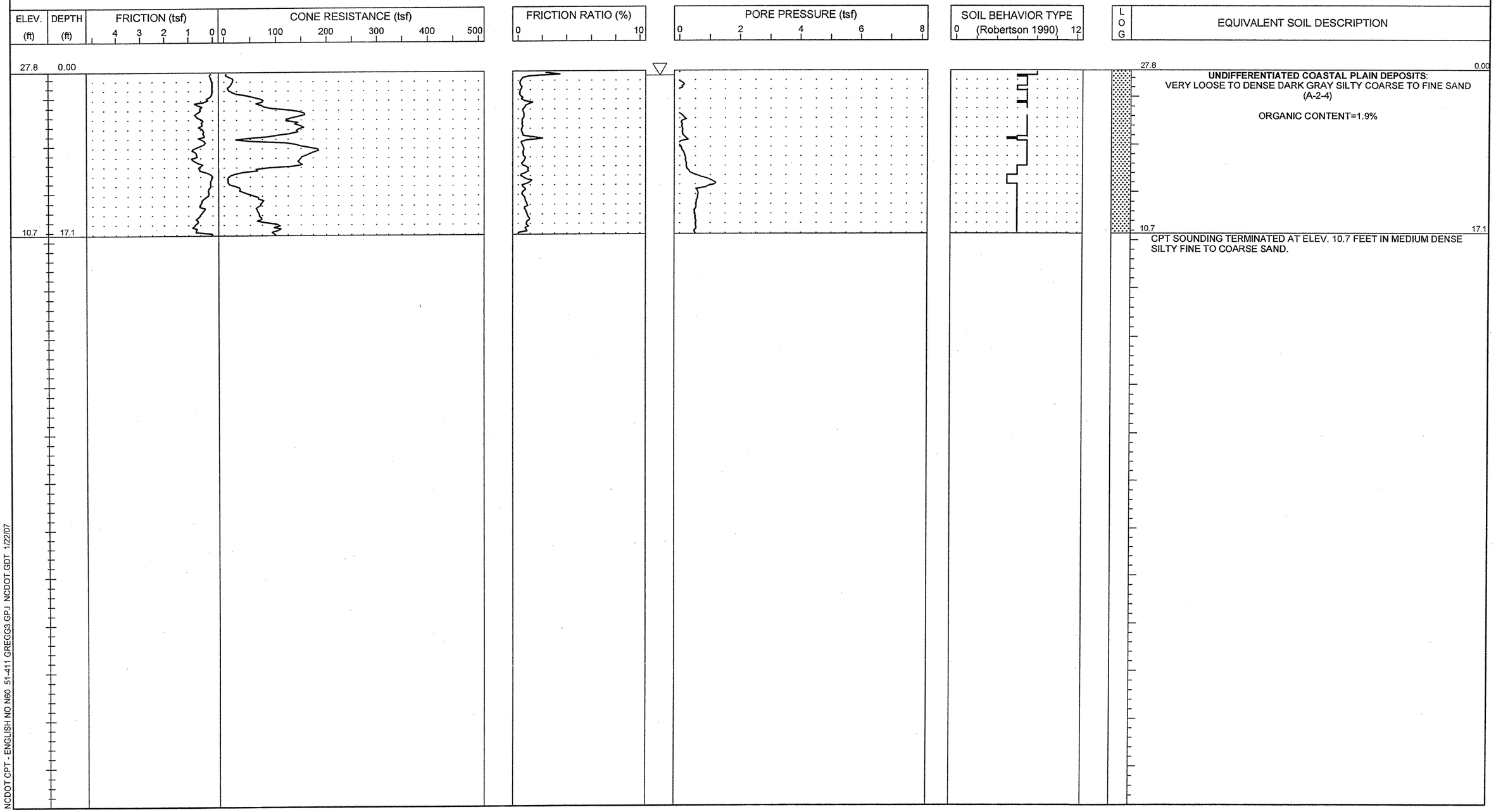
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 91	**BORING LOCATION** 210+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.5	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.8 ft	**NORTHING** 192,688.9	**EASTING** 2,289,870.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60_51-411 GREGG3.GPJ NCDOT.GDT 1/22/07

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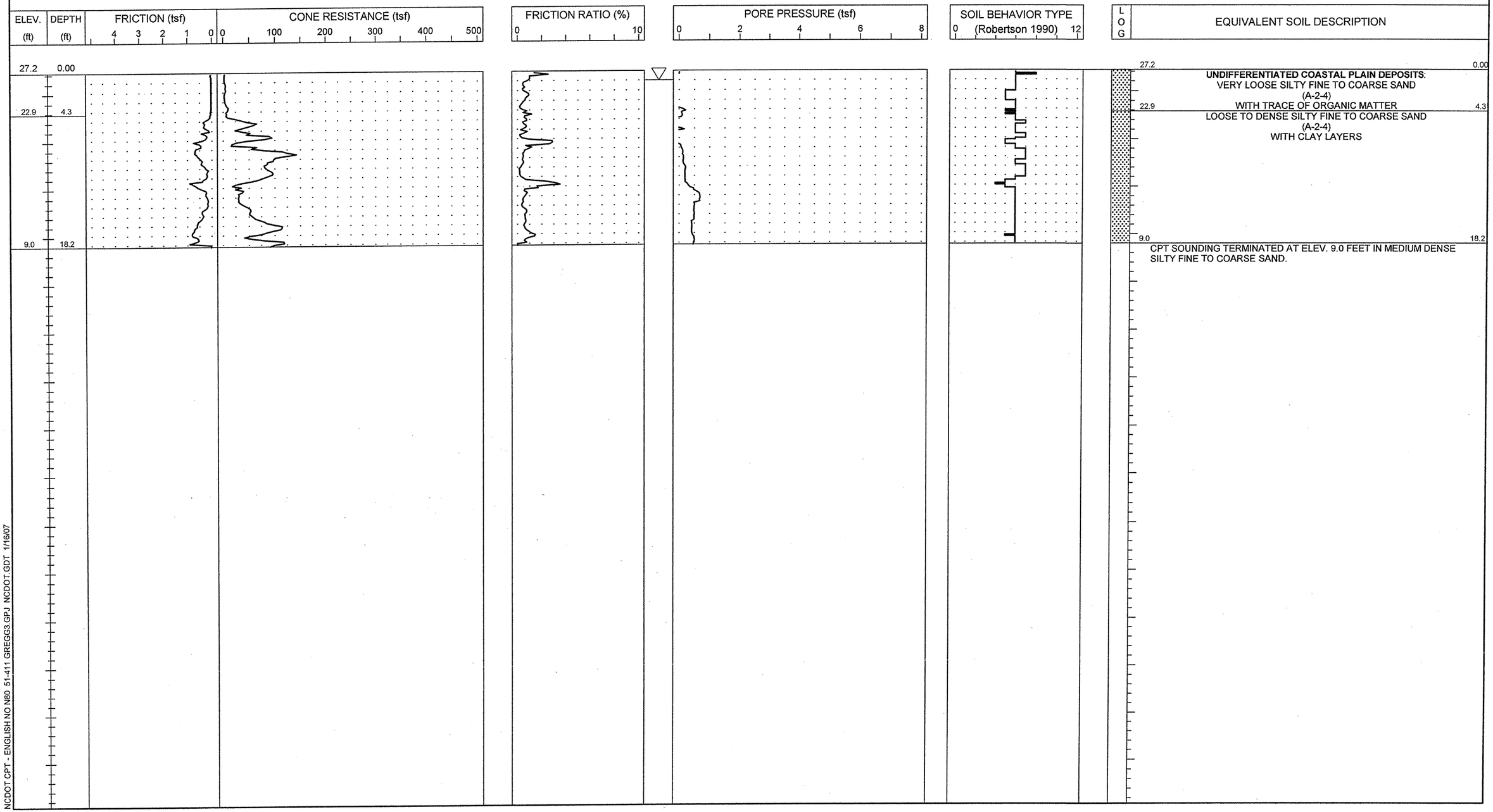
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 18.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 92	**BORING LOCATION** 212+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.2 ft	**NORTHING** 192,632.2	**EASTING** 2,290,062.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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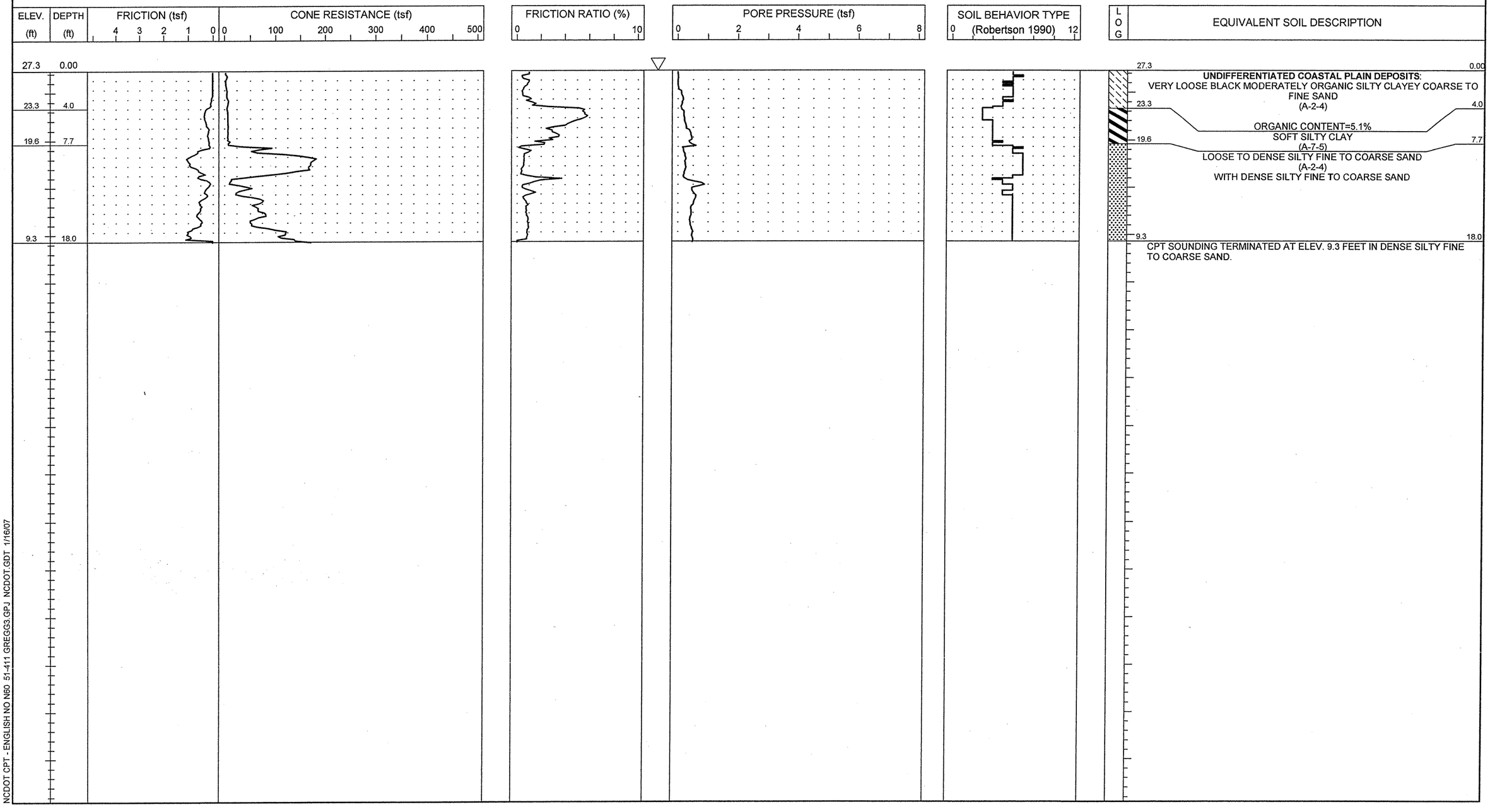
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 18.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 93	**BORING LOCATION** 214+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/25/06	**COMPLETED** 10/25/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.3 ft	**NORTHING** 192,575.5	**EASTING** 2,290,253.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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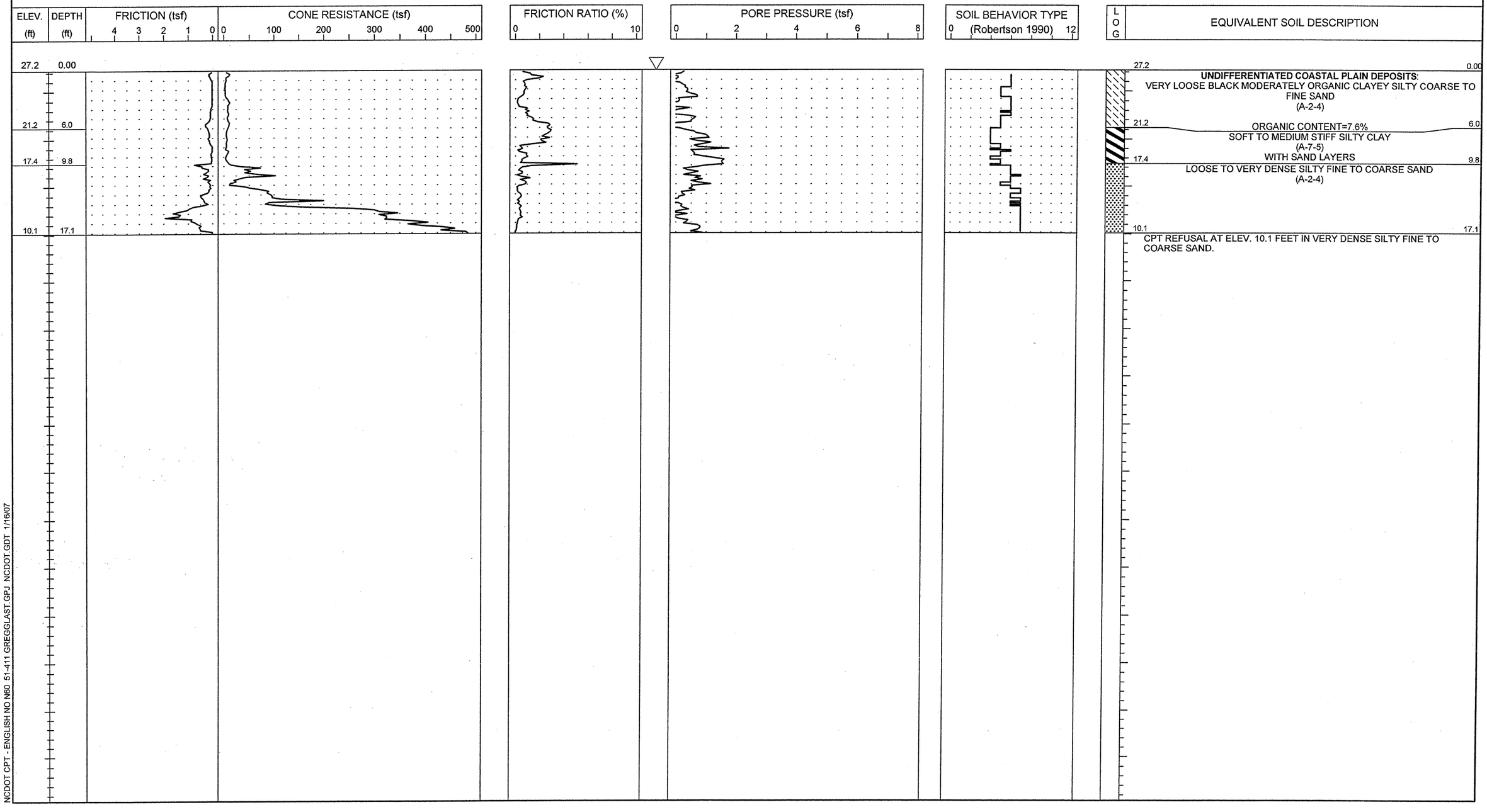
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 94	**BORING LOCATION** 216+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.2 ft	**NORTHING** 192,518.8	**EASTING** 2,290,445.5		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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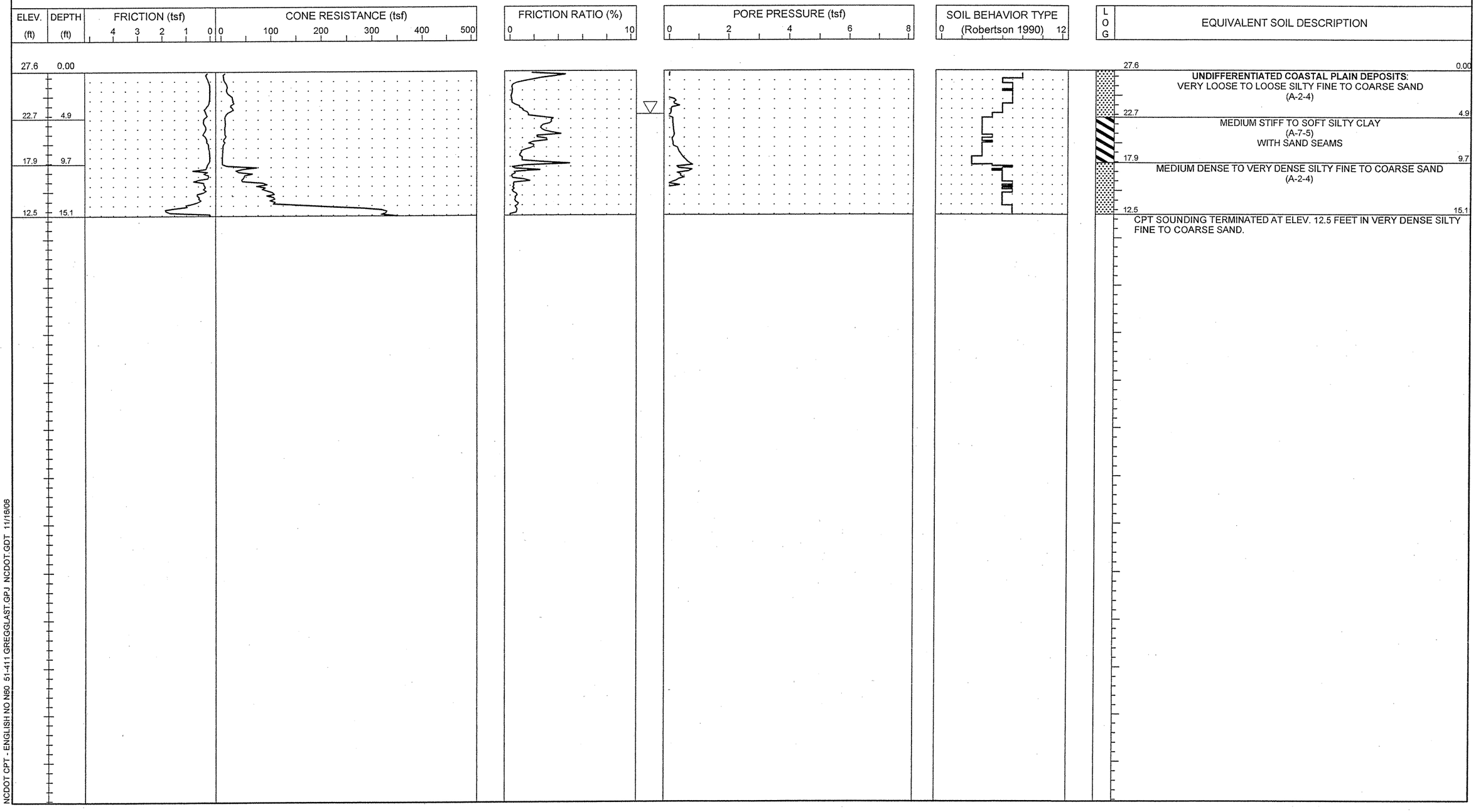
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 95	**BORING LOCATION** 218+00	**OFFSET** 0.0 ft CL **ALIGNMENT** -L-	**0 HR.** 4.5	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 27.6 ft	**NORTHING** 192,462.1	**EASTING** 2,290,637.3	**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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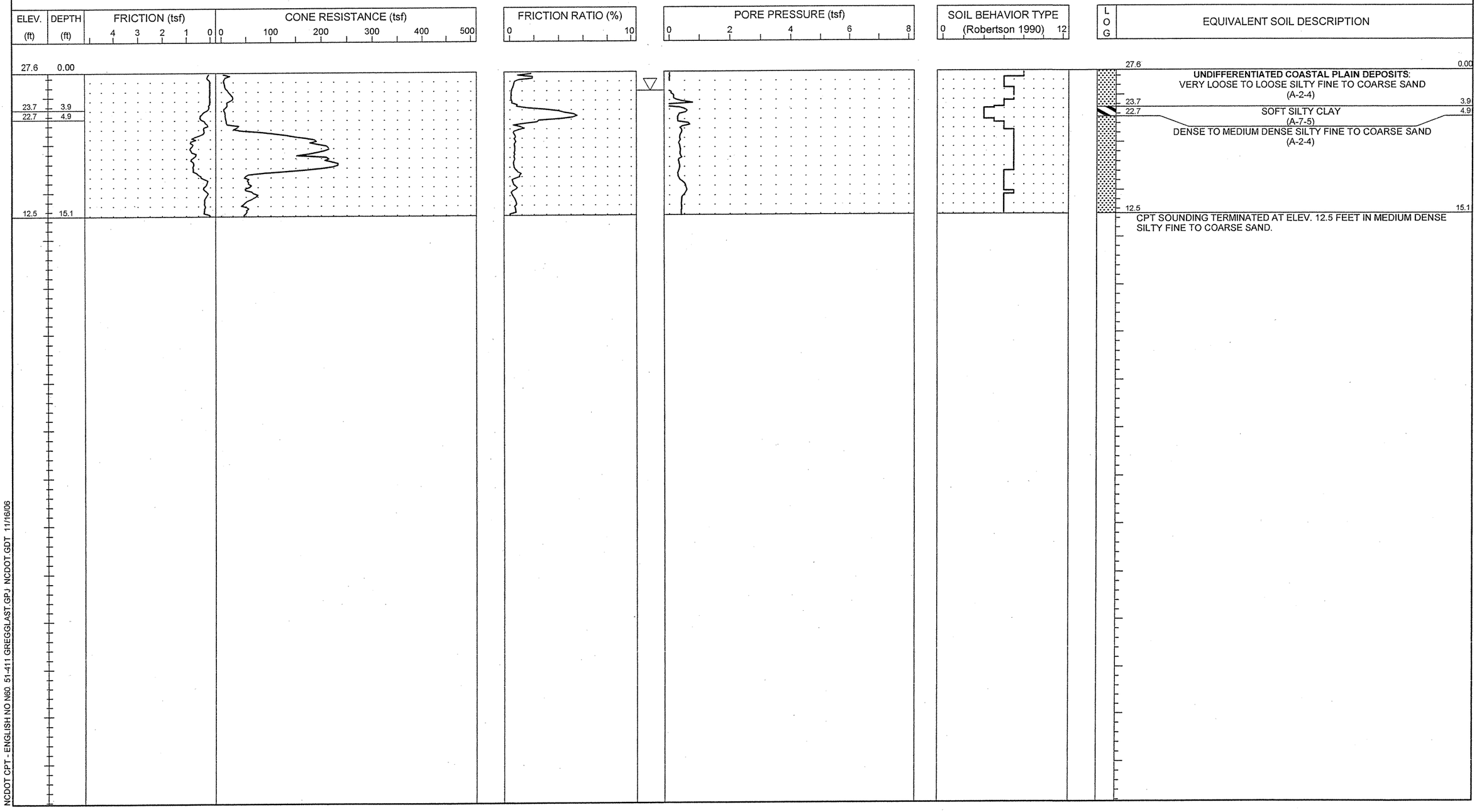
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 96	**BORING LOCATION** 220+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.6 ft	**NORTHING** 192,405.4	**EASTING** 2,290,829.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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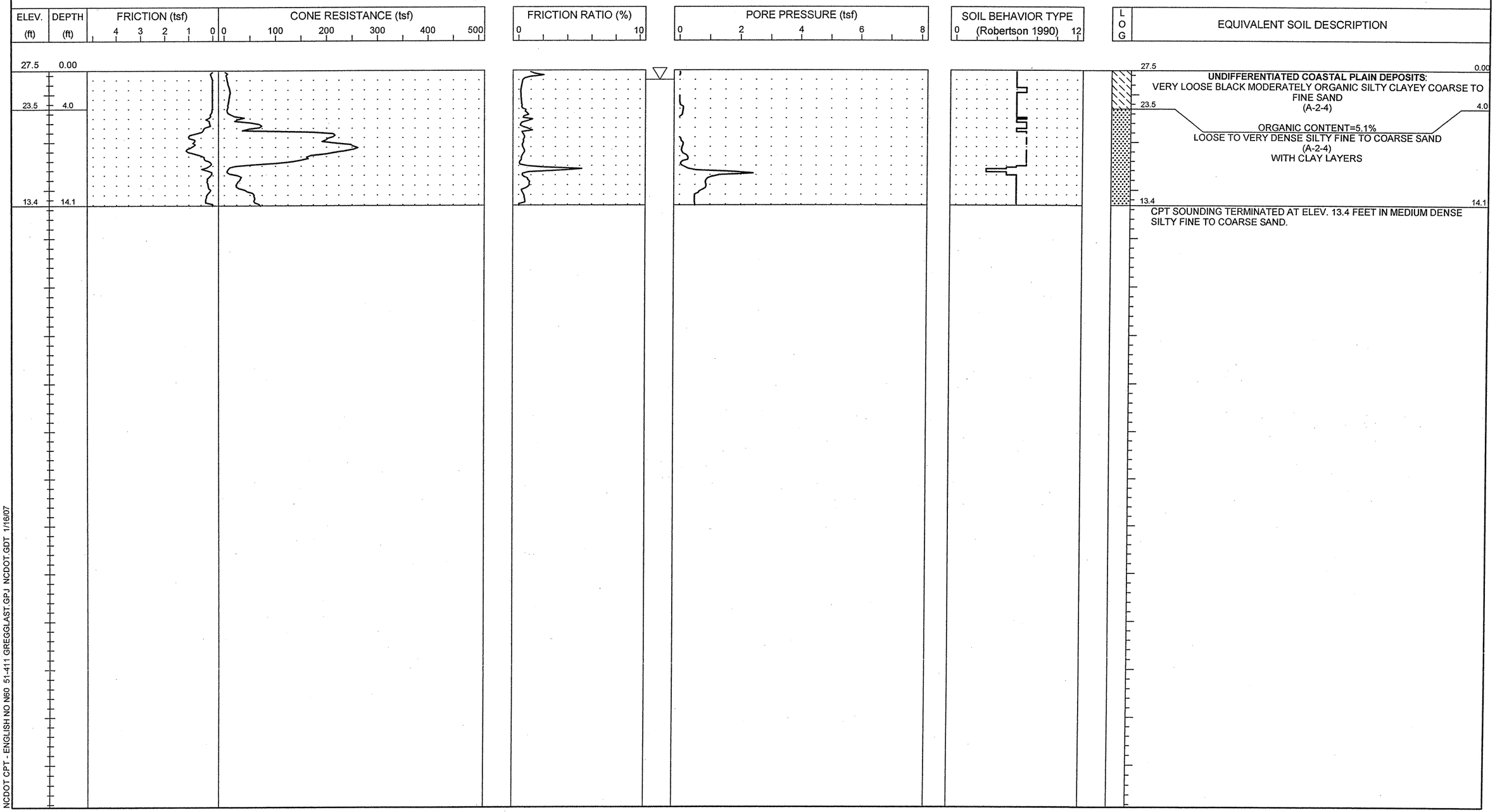
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 97	**BORING LOCATION** 222+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.5 ft	**NORTHING** 192,348.7	**EASTING** 2,291,020.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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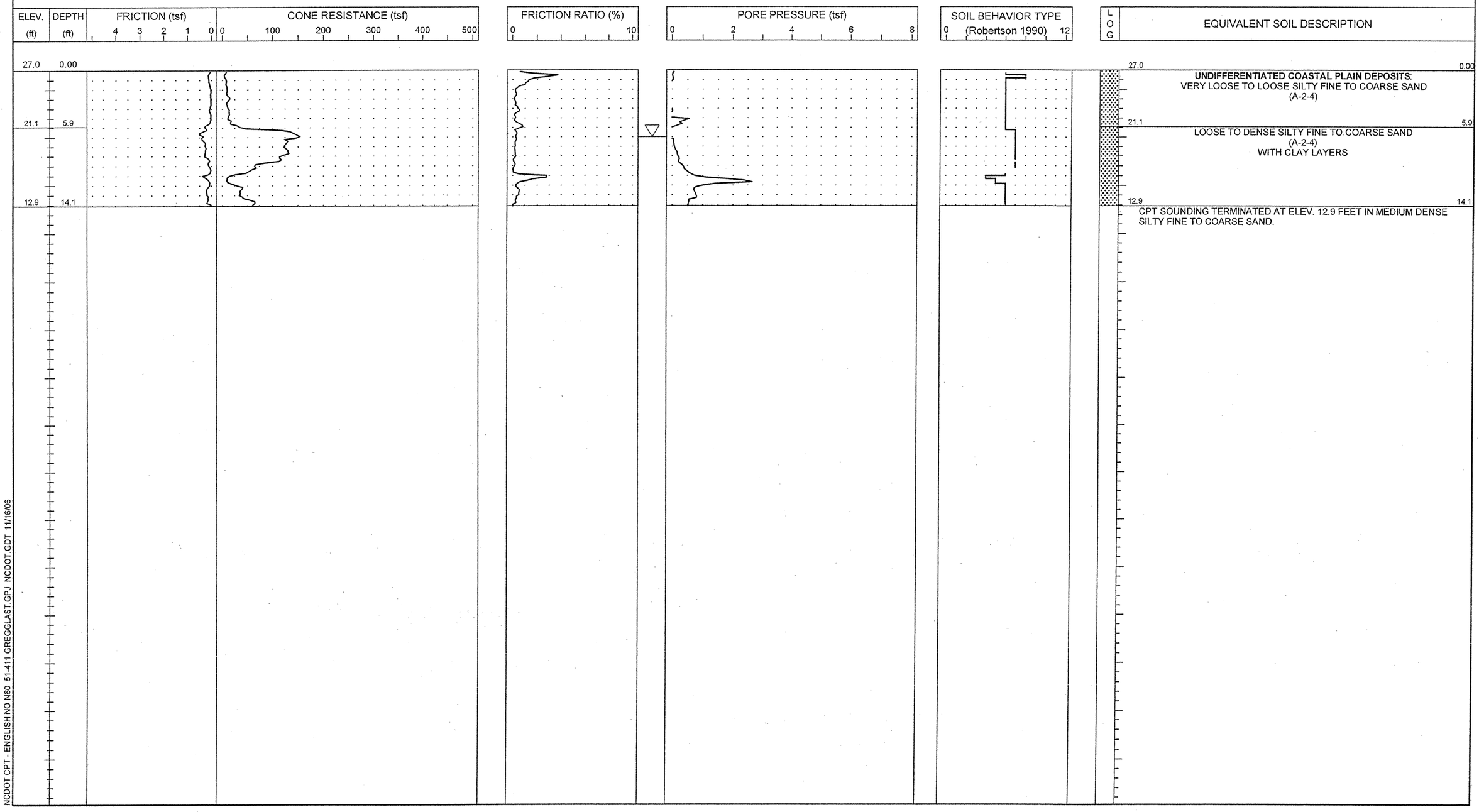
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 98	**BORING LOCATION** 224+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.0	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.0 ft	**NORTHING** 192,292.0	**EASTING** 2,291,212.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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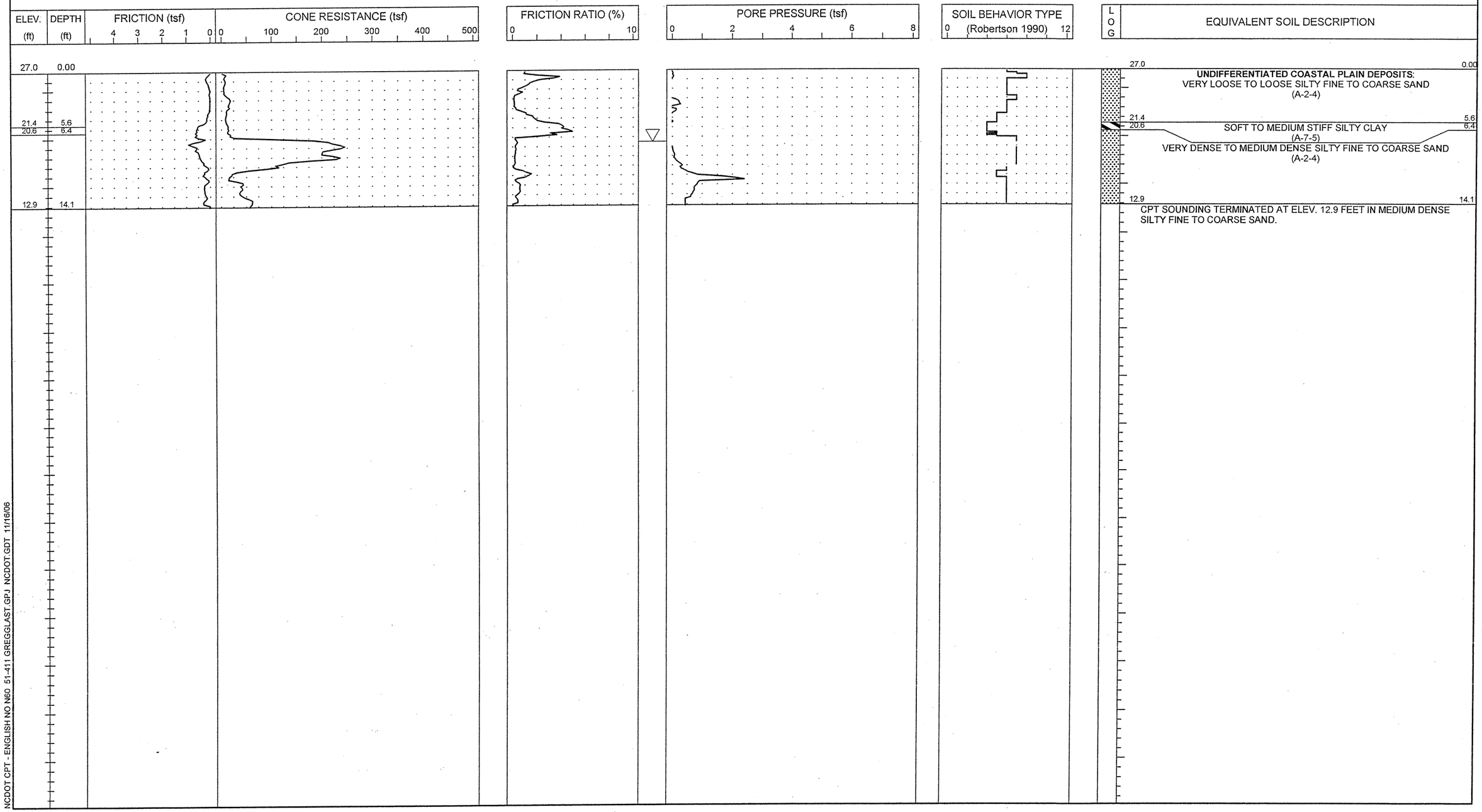
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C- 99	**BORING LOCATION** 226+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.5	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.0 ft	**NORTHING** 192,235.4	**EASTING** 2,291,404.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



EQUIVALENT SOIL DESCRIPTION

27.0 — 0.00

UNDIFFERENTIATED COASTAL PLAIN DEPOSITS:
VERY LOOSE TO LOOSE SILTY FINE TO COARSE SAND
(A-2-4)

21.4 — 5.6
20.6 — 6.4

SOFT TO MEDIUM STIFF SILTY CLAY
(A-7-5)

VERY DENSE TO MEDIUM DENSE SILTY FINE TO COARSE SAND
(A-2-4)

12.9 — 14.1

CPT SOUNDING TERMINATED AT ELEV. 12.9 FEET IN MEDIUM DENSE SILTY FINE TO COARSE SAND.

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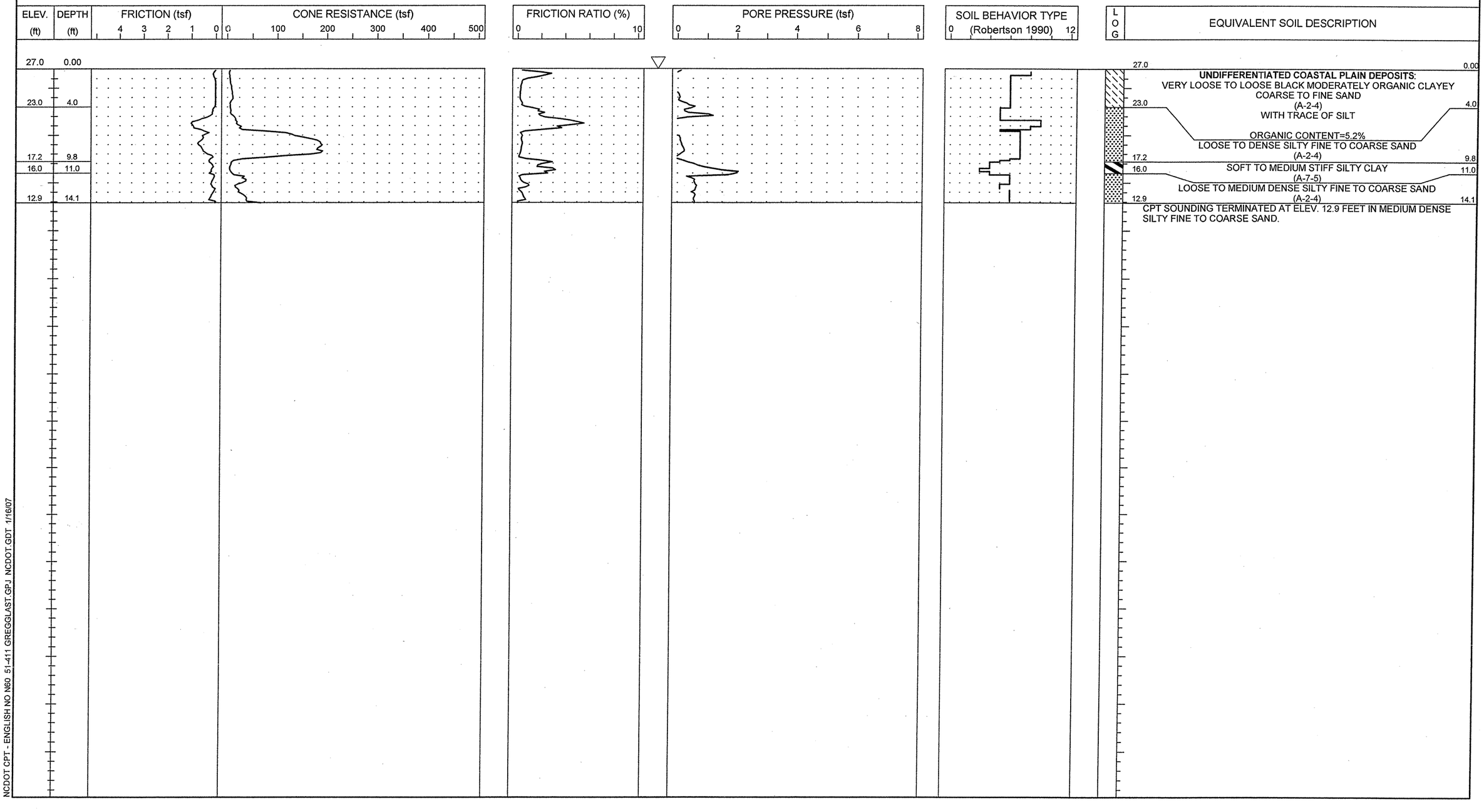
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-100	**BORING LOCATION** 228+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 0.0	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 27.0 ft	**NORTHING** 192,181.2	**EASTING** 2,291,597.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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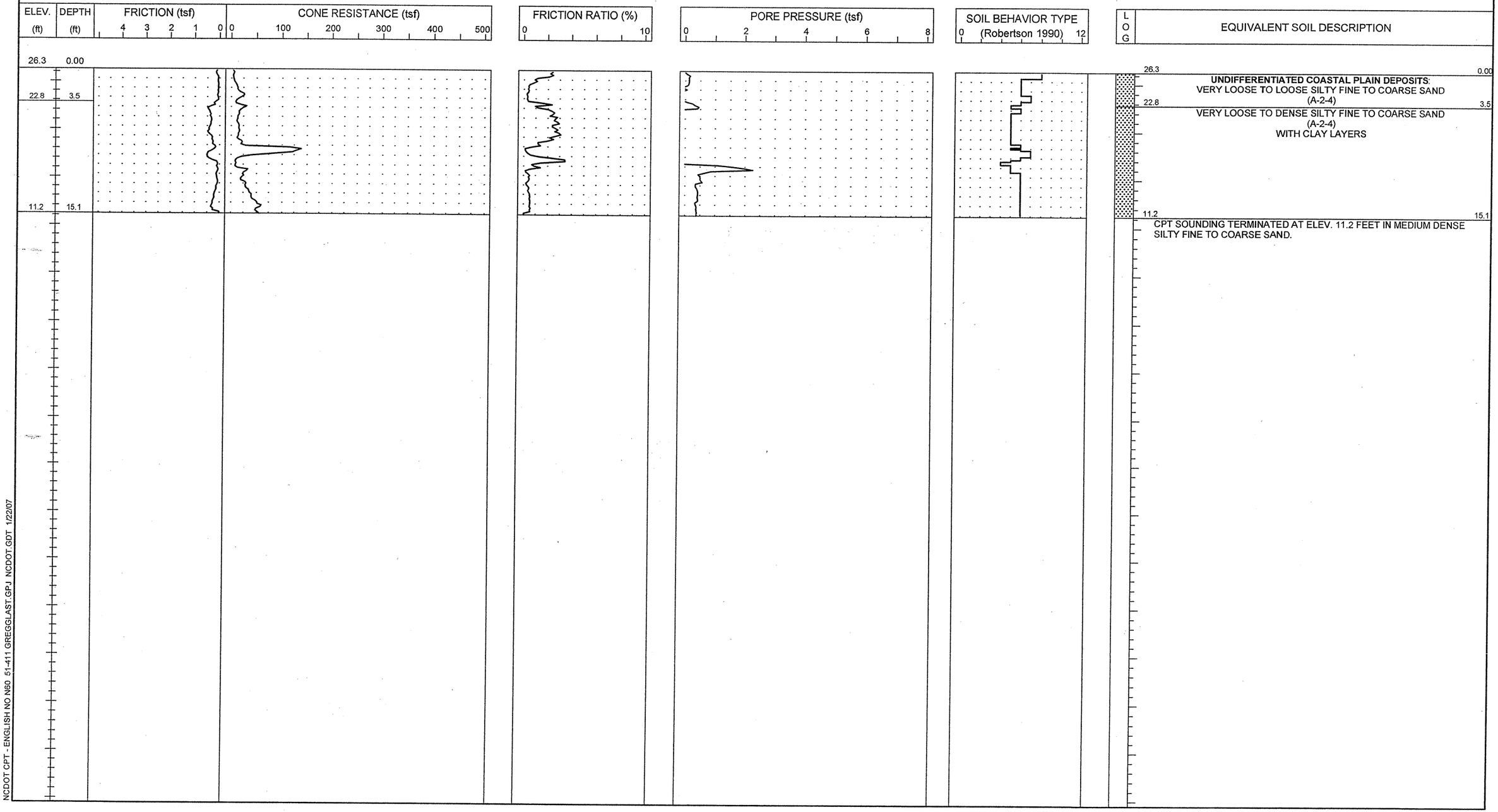
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-102	**BORING LOCATION** 232+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/31/06	**COMPLETED** 10/31/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 26.3 ft	**NORTHING** 192,082.7	**EASTING** 2,291,984.7		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



NCDOT CPT - ENGLISH NO N60 51-411 GREGGLAST.GPJ NCDOT.GDT 1/22/07

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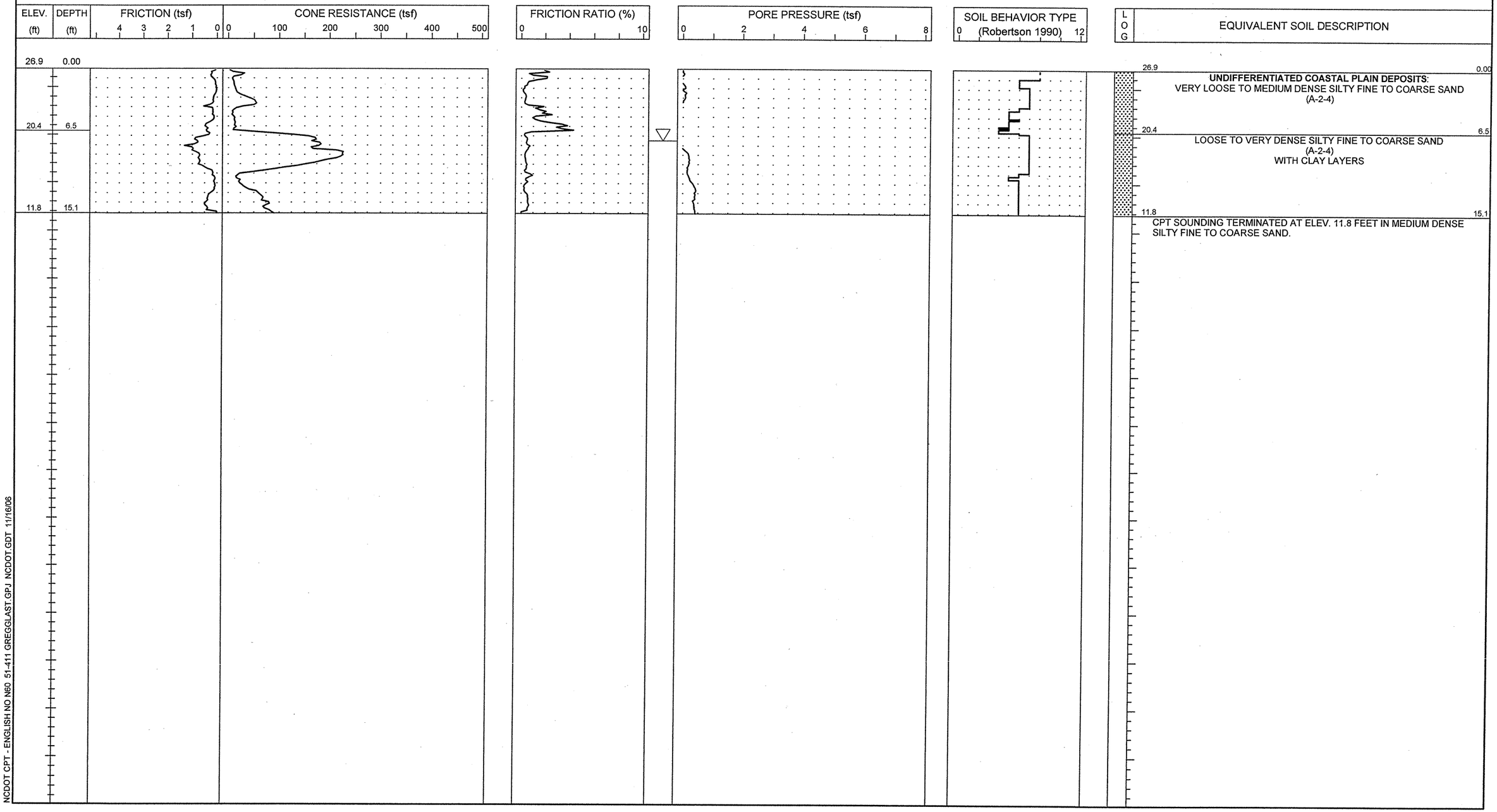
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-103	**BORING LOCATION** 234+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.5	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 26.9 ft	**NORTHING** 192,038.6	**EASTING** 2,292,179.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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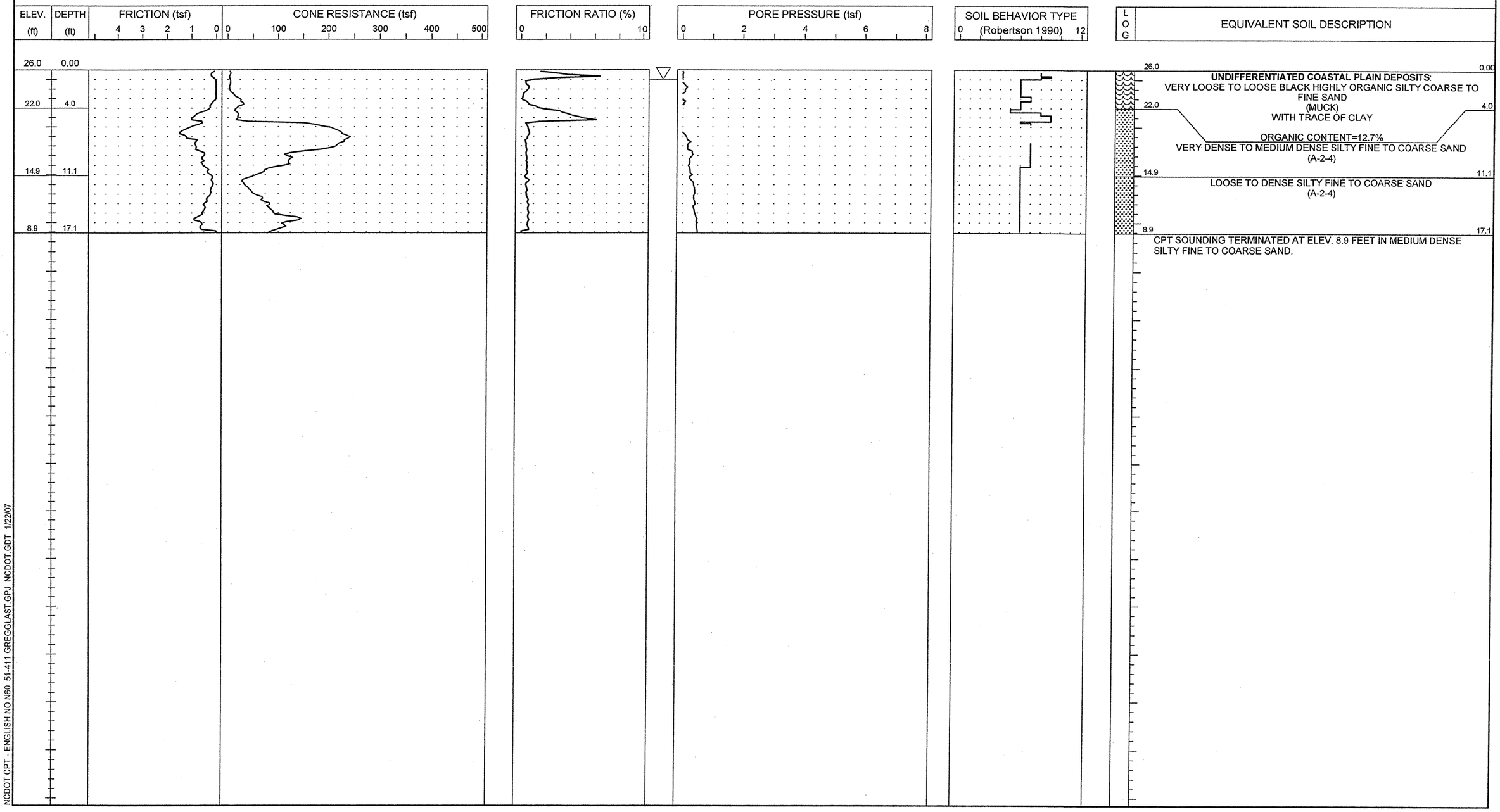
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-104	**BORING LOCATION** 236+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 1.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 26.0 ft	**NORTHING** 191,997.8	**EASTING** 2,292,375.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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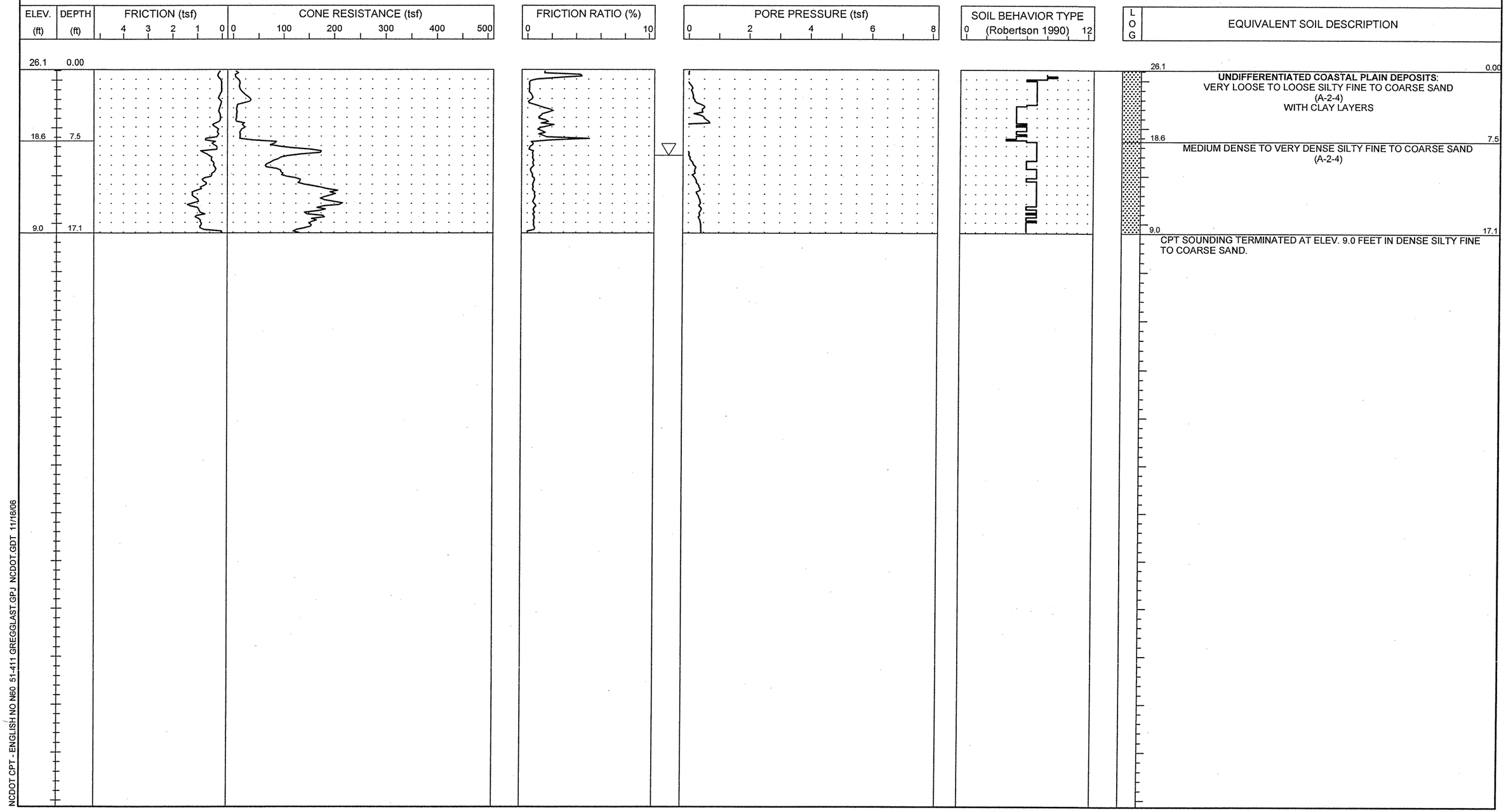
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-105	**BORING LOCATION** 238+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 9.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 26.1 ft	**NORTHING** 191,960.5	**EASTING** 2,292,572.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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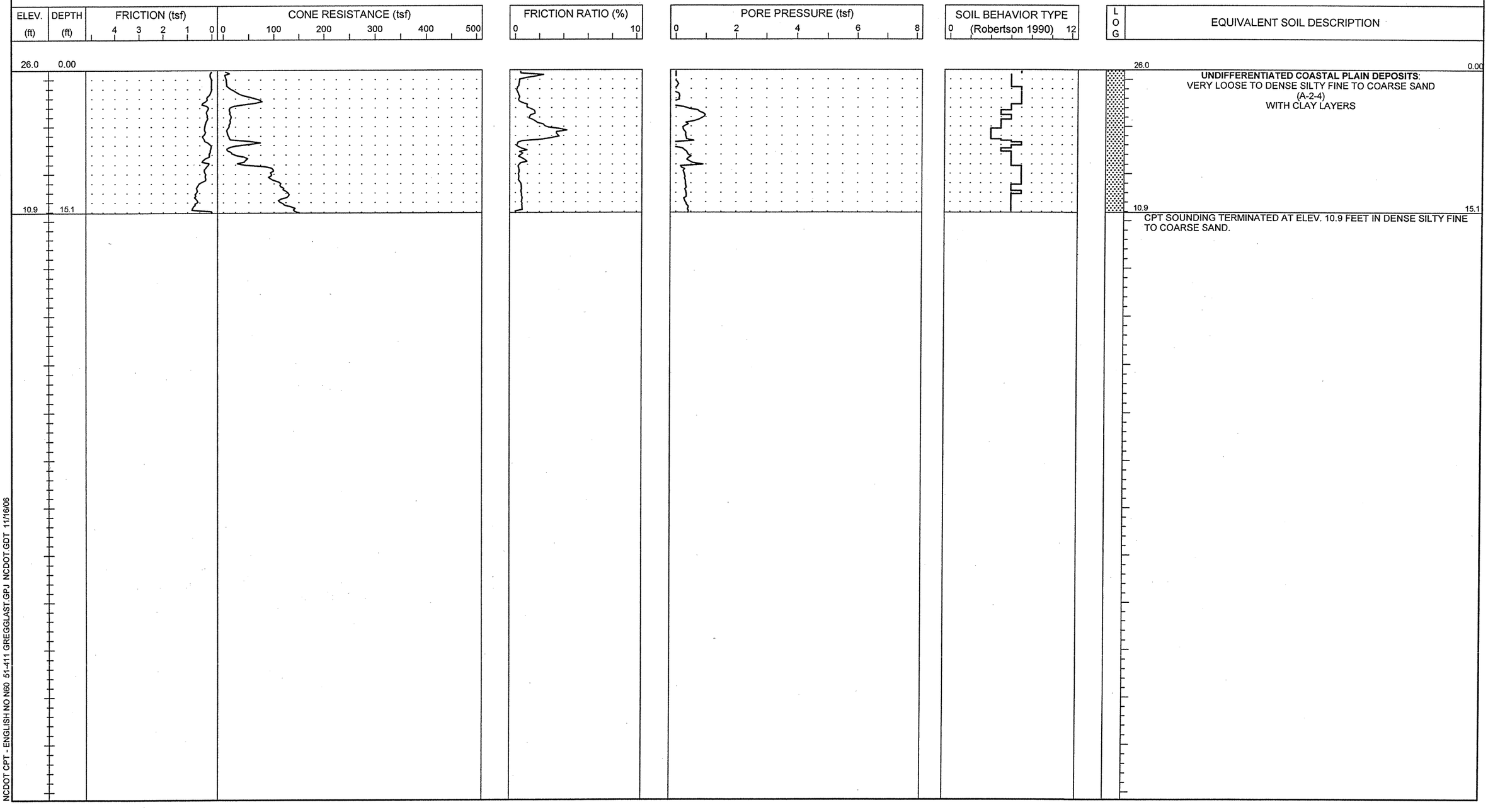
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-106	**BORING LOCATION** 240+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 26.0 ft	**NORTHING** 191,926.6	**EASTING** 2,292,769.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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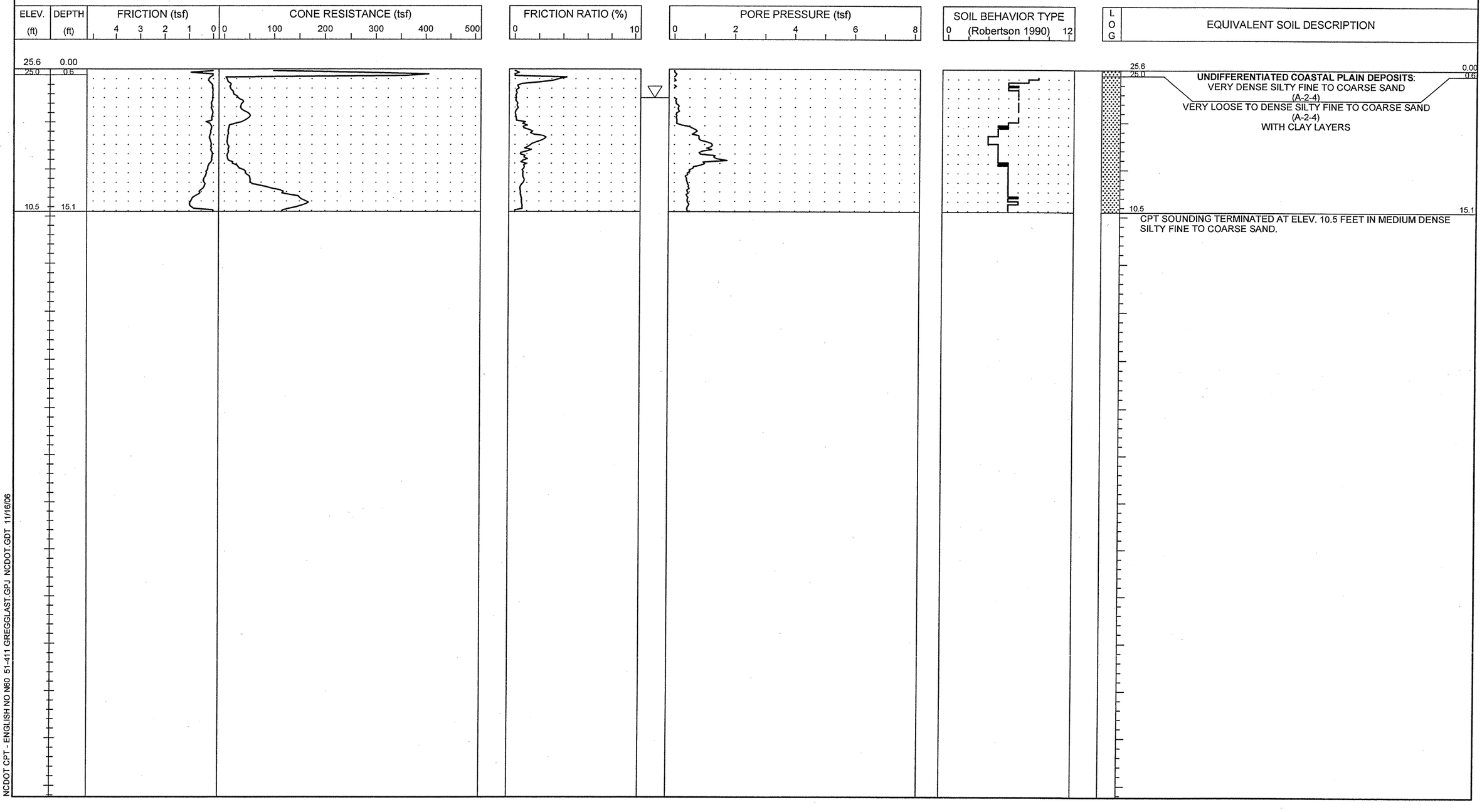
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-107	**BORING LOCATION** 242+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 25.6 ft	**NORTHING** 191,896.1	**EASTING** 2,292,966.8		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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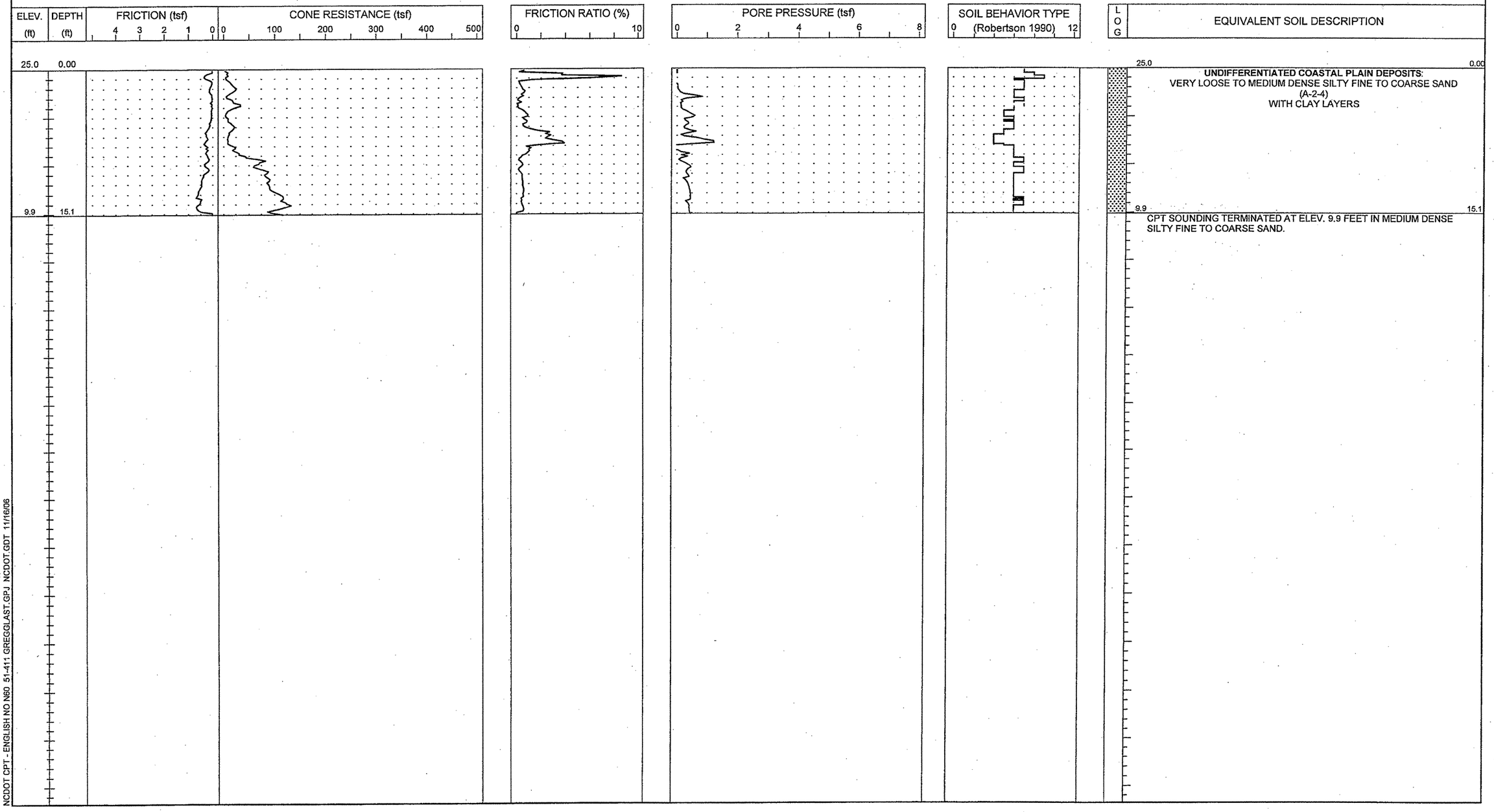
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-108	**BORING LOCATION** 244+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 25.0 ft	**NORTHING** 191,869.0	**EASTING** 2,293,165.0		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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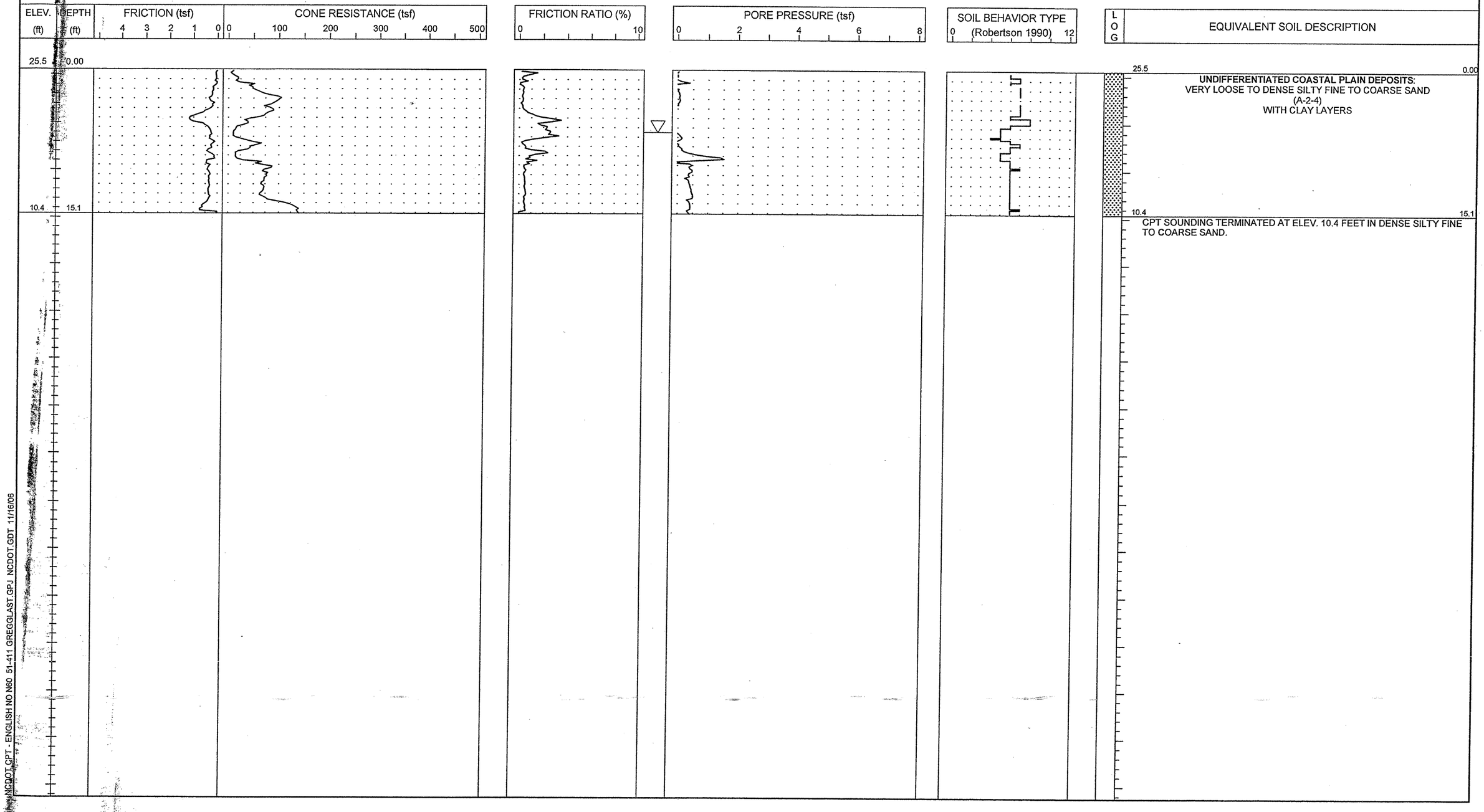
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-109	**BORING LOCATION** 246+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 6.5	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 25.5 ft	**NORTHING** 191,845.5	**EASTING** 2,293,363.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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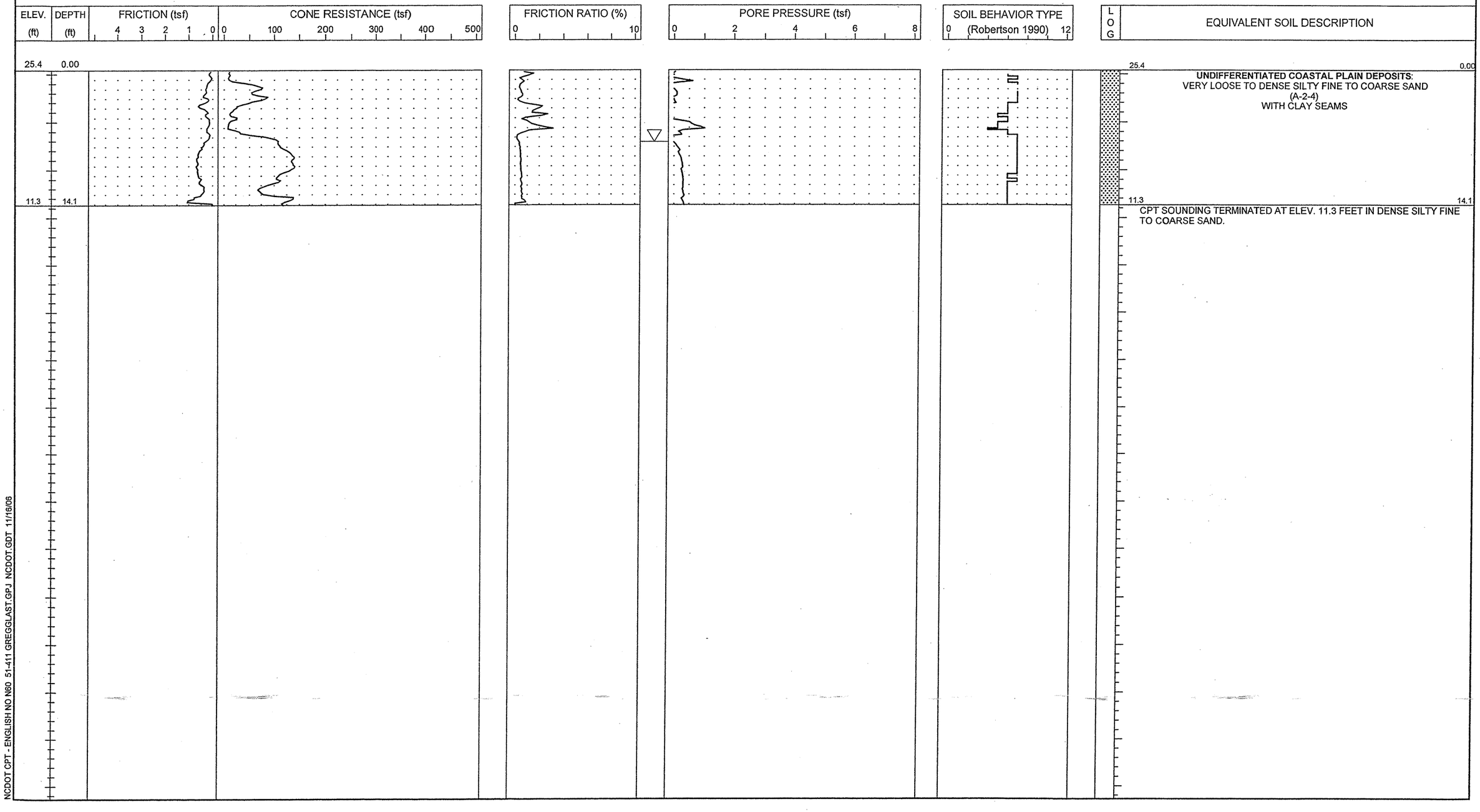
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 14.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-110	**BORING LOCATION** 248+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.5	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 25.4 ft	**NORTHING** 191,825.3	**EASTING** 2,293,562.6		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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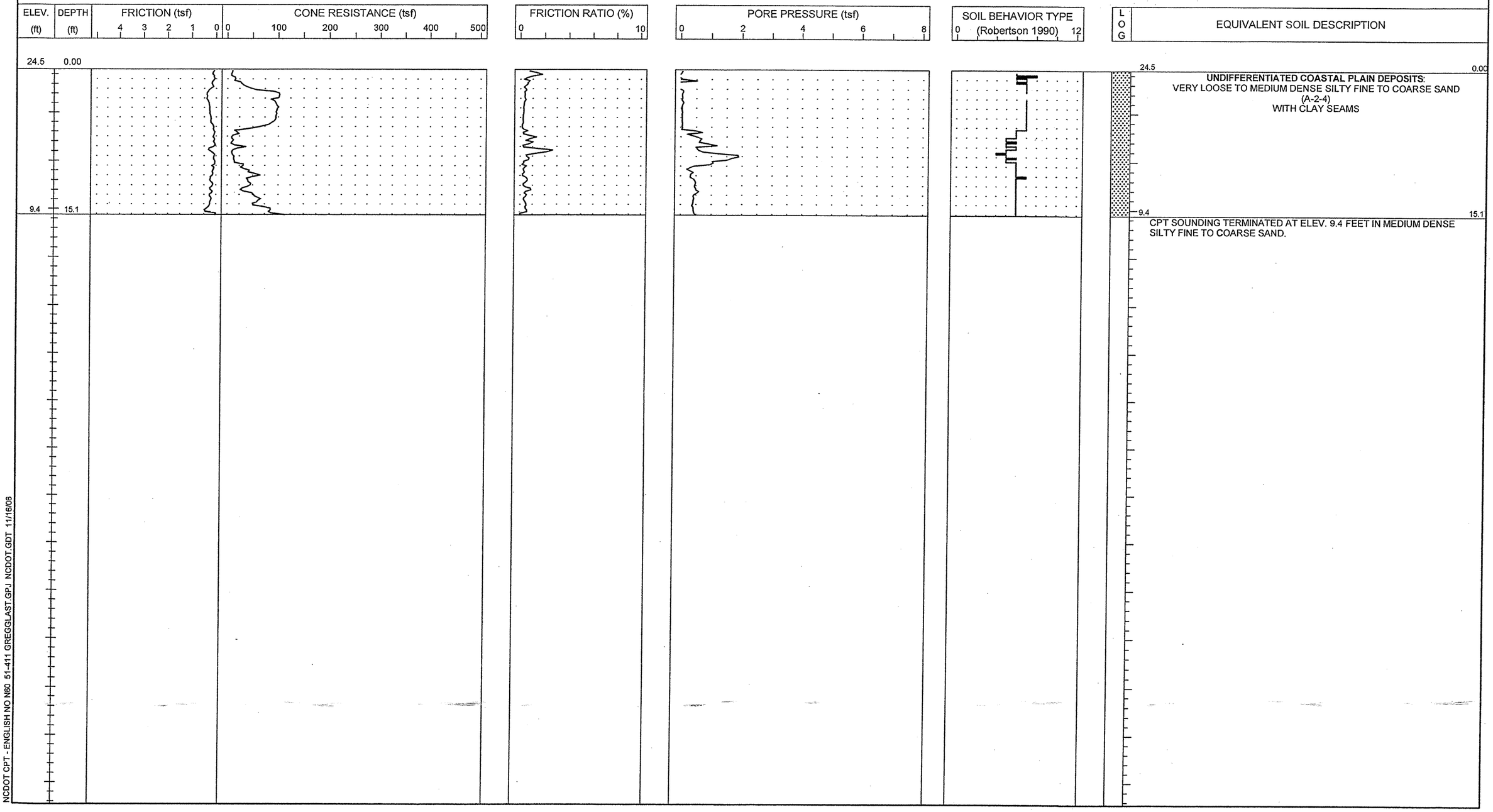
BORING LOG

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 15.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-111	**BORING LOCATION** 250+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 24.5 ft	**NORTHING** 191,808.7	**EASTING** 2,293,761.9		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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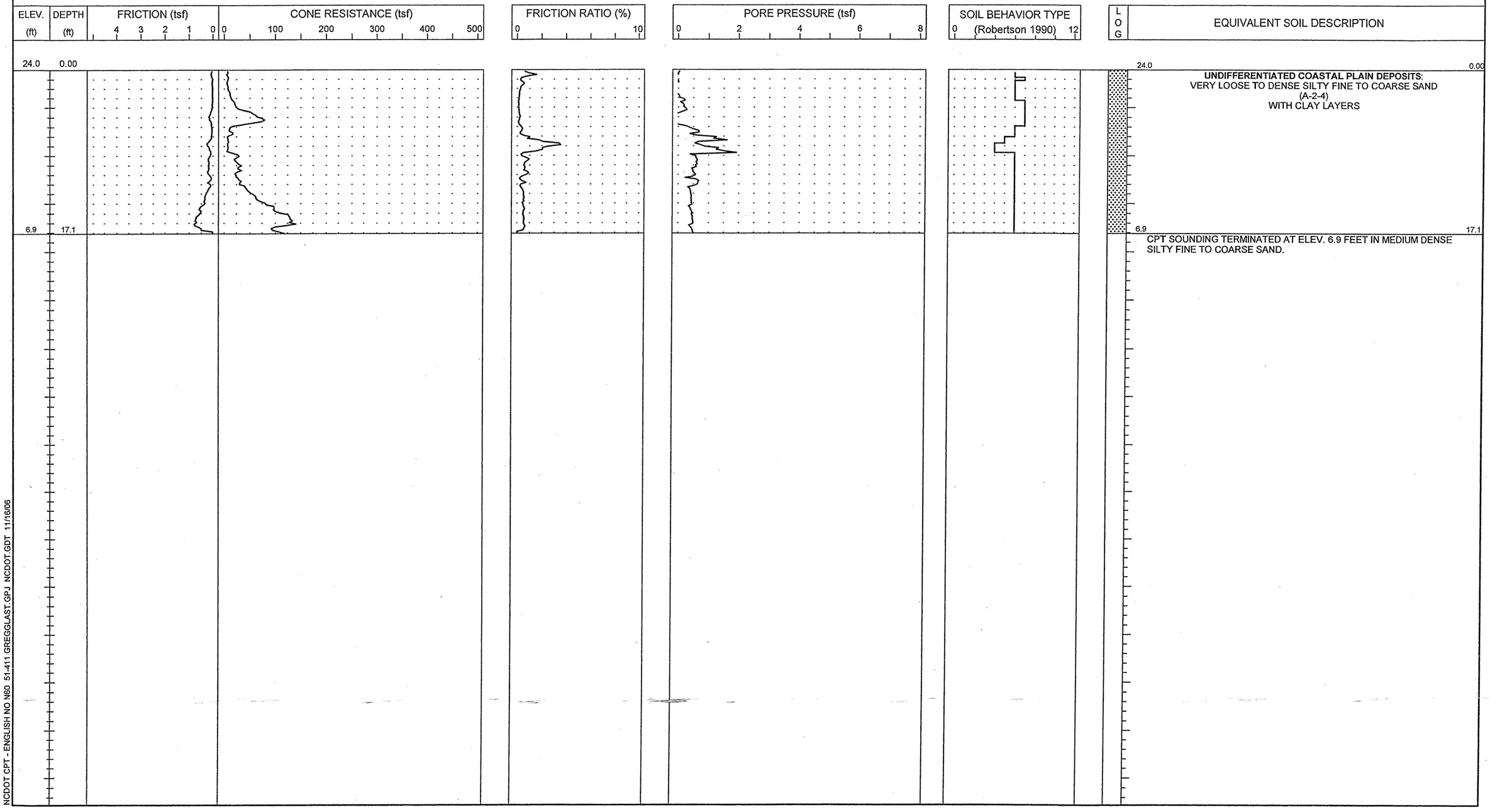
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 17.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-112	**BORING LOCATION** 252+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/M	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 24.0 ft	**NORTHING** 191,795.5	**EASTING** 2,293,961.4		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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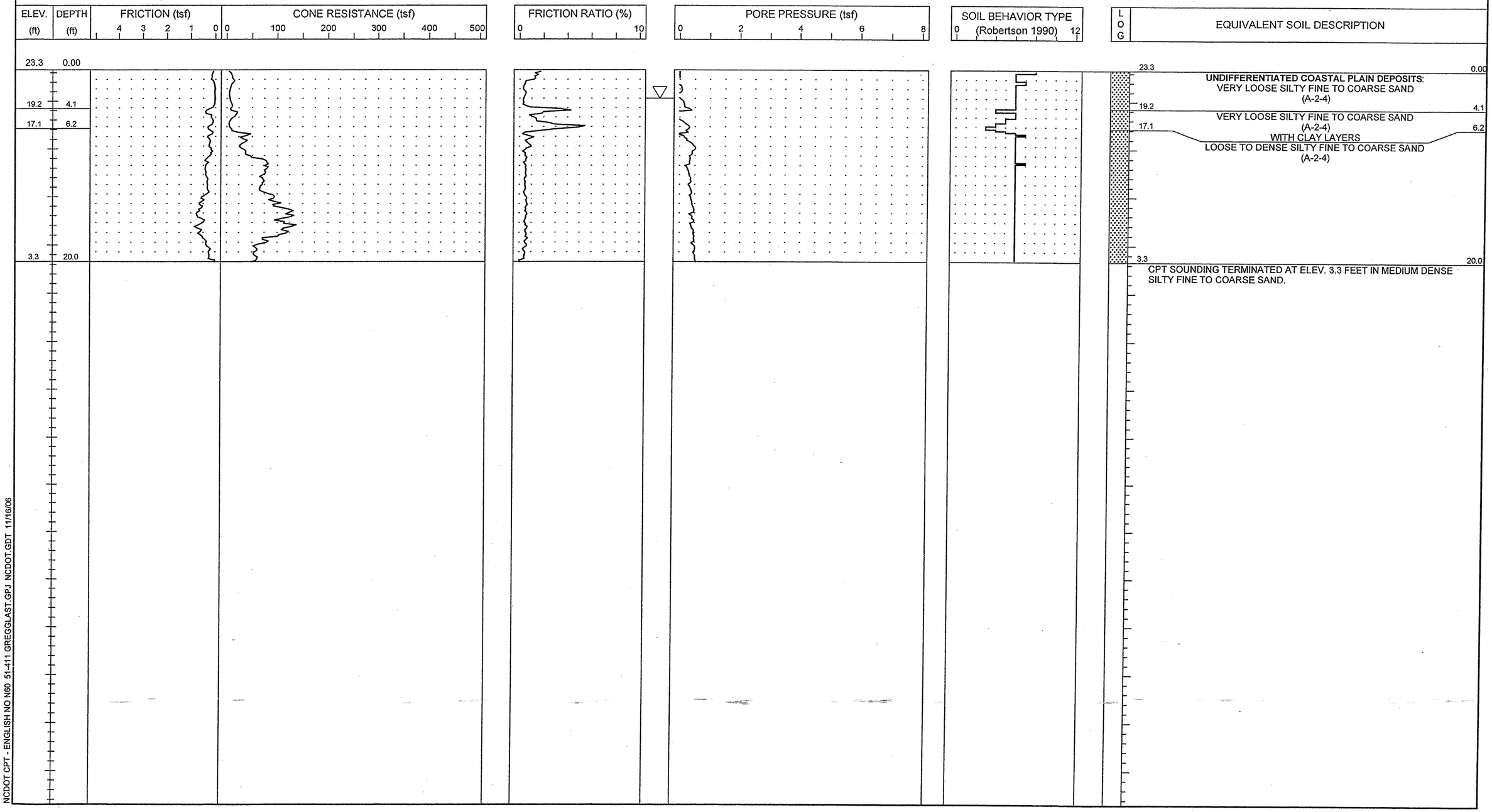
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 20.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-113	**BORING LOCATION** 254+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 23.3 ft	**NORTHING** 191,785.7	**EASTING** 2,294,161.2		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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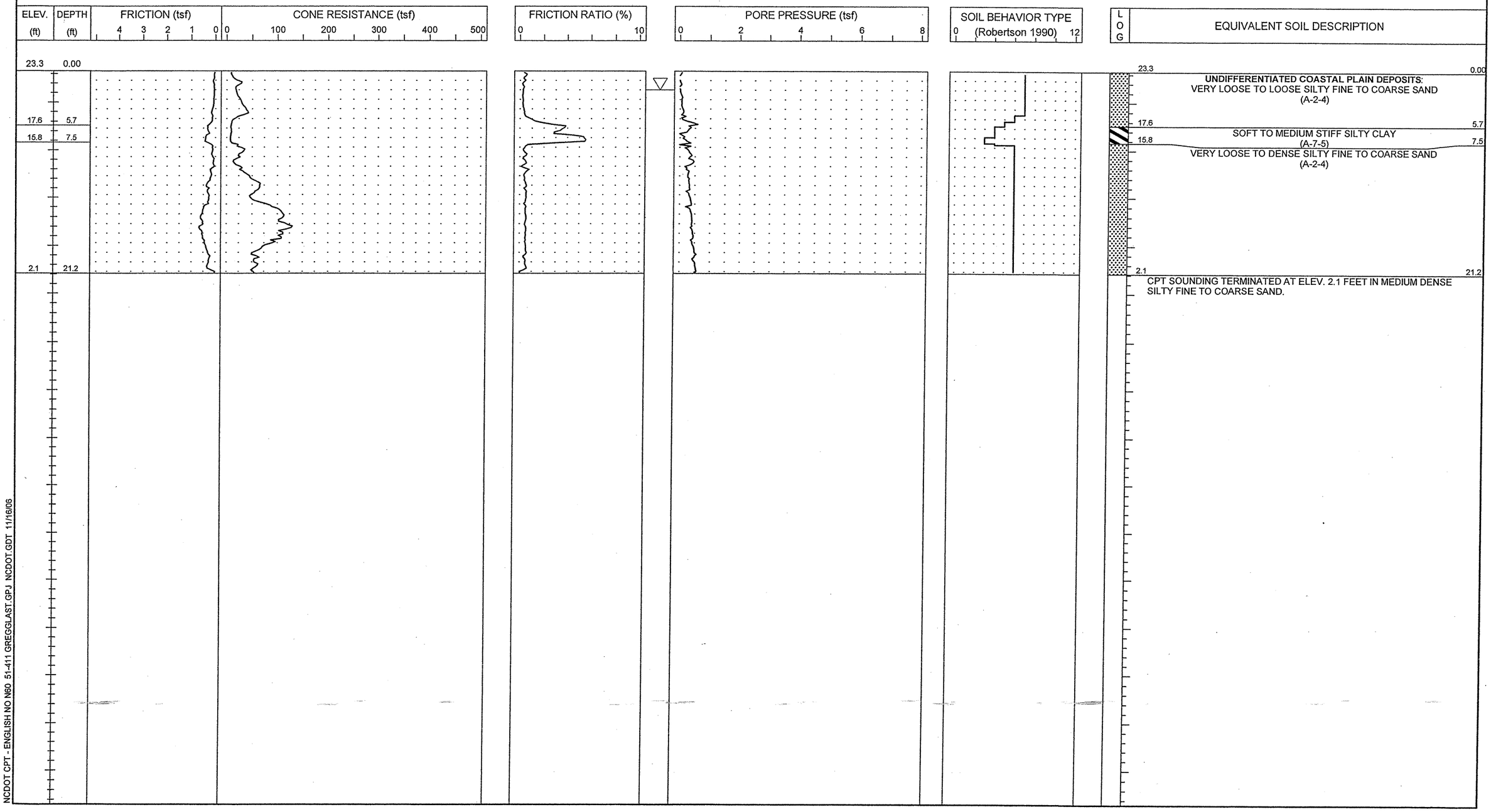
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 21.2 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-114	**BORING LOCATION** 256+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 2.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A	
COLLAR ELEV. 23.3 ft	**NORTHING** 191,779.5	**EASTING** 2,294,361.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN		



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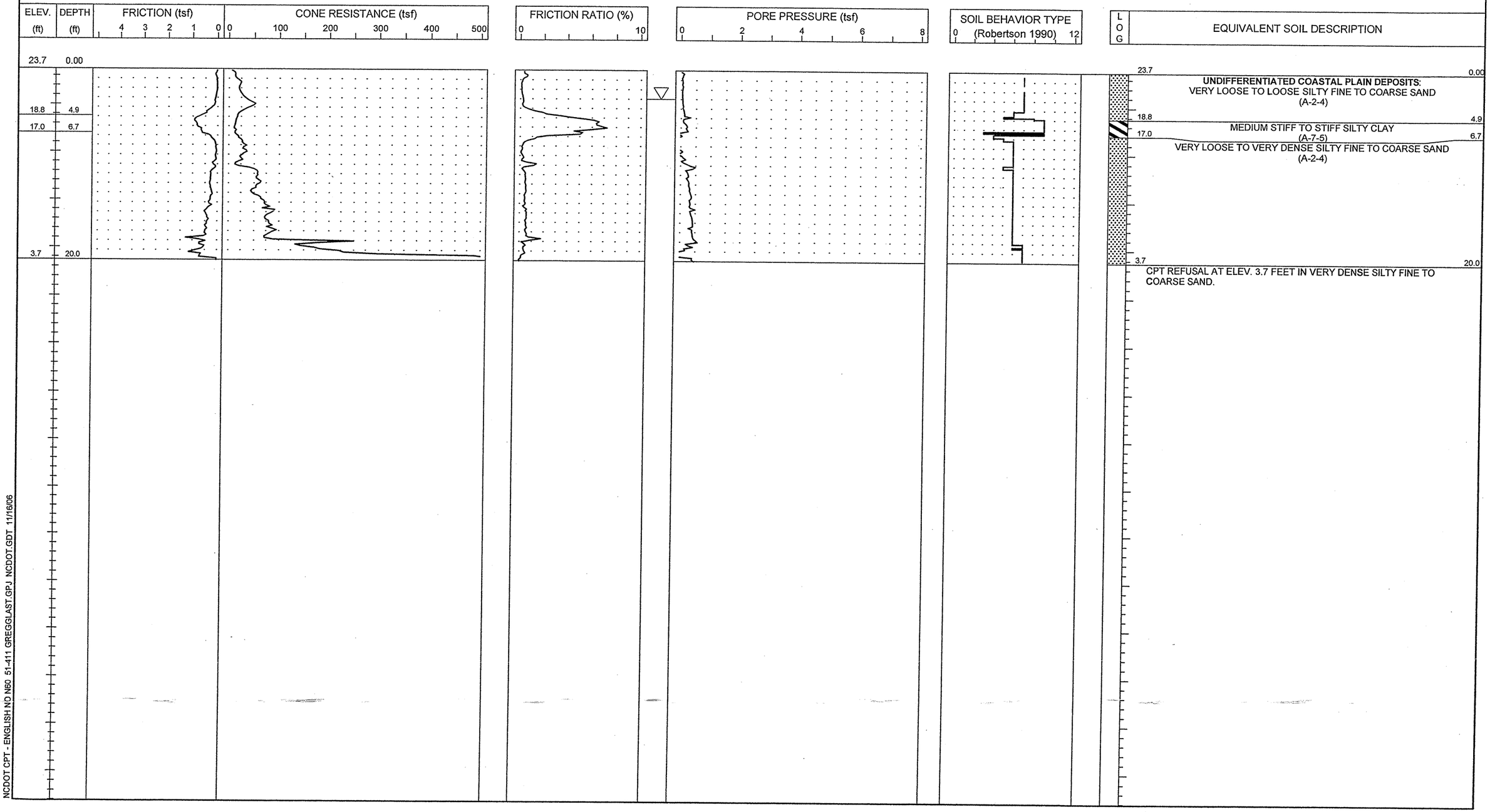
SHEET 1 OF 1

PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON	**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf	
SITE DESCRIPTION US 17 (Wilmington Bypass)			**GROUND WATER (ft)**	**TOTAL DEPTH** 20.0 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-115	**BORING LOCATION** 258+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 3.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 23.7 ft	**NORTHING** 191,776.7	**EASTING** 2,294,561.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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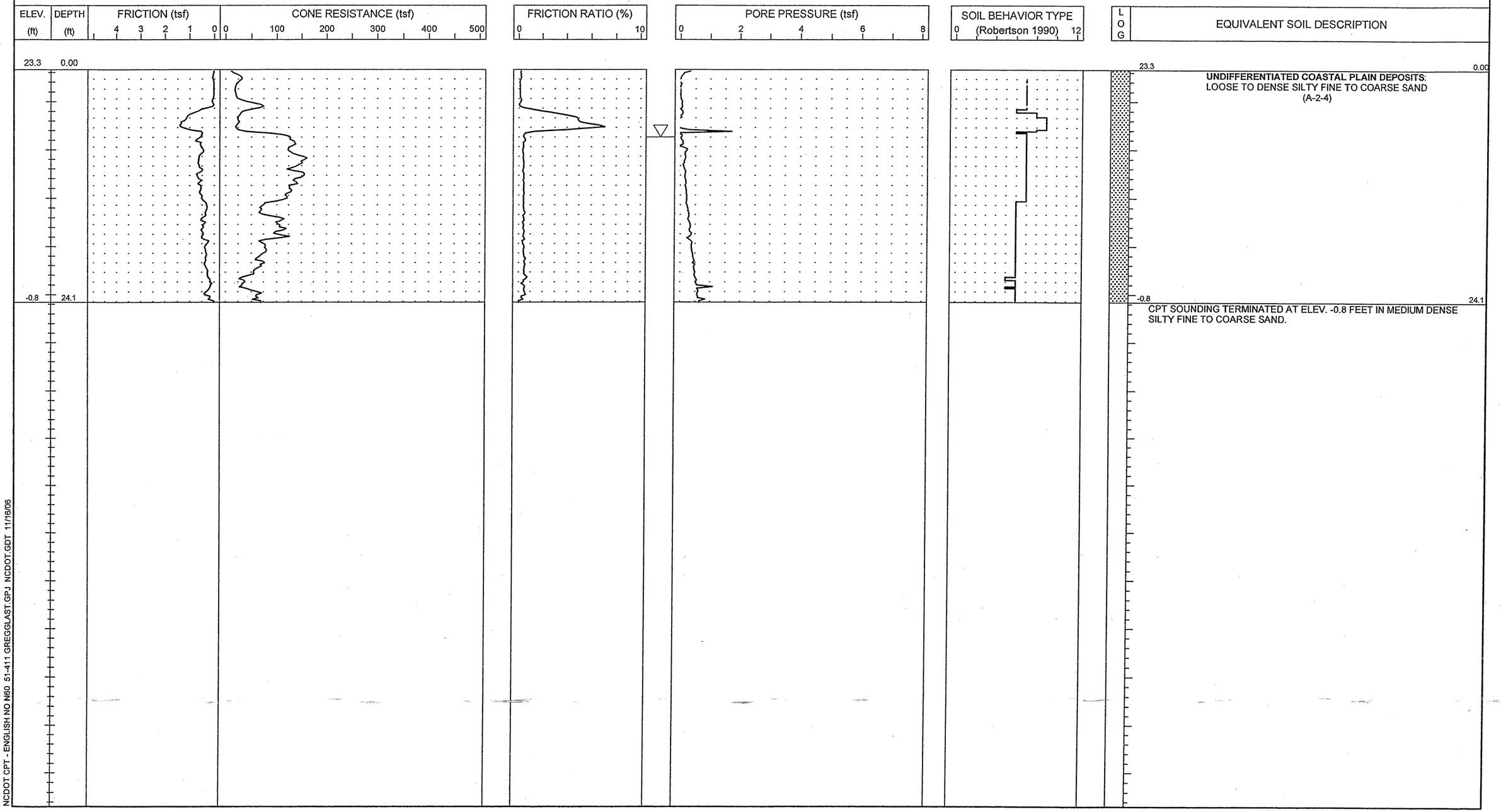
PROJECT NO. 34491.1.2	**ID.** R-2633B	**COUNTY** New Hanover/ Brunswick	**GEOLOGIST** S. JOHNSON		**TYPE OF CONE** 1.75 In. PEIZO CONE	**ROD TYPE** 1.75 in Dia.	**MAXIMUM DOWN PRESSURE** Approximately 920 tsf
SITE DESCRIPTION US 17 (Wilmington Bypass)				**GROUND WATER (ft)**	**TOTAL DEPTH** 24.1 ft	**DRILL MACHINE** CPT-ATV	**DRILL METHOD** Direct Push	**HAMMER TYPE** N/A
BORING NO. C-116	**BORING LOCATION** 260+00	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** 7.0	**DATE STARTED** 10/30/06	**COMPLETED** 10/30/06	**SURFACE WATER DEPTH** N/A
COLLAR ELEV. 23.3 ft	**NORTHING** 191,777.4	**EASTING** 2,294,761.1		**24 HR.** N/M	**DRILLER:** RUPERTO	**TECHNICIAN** SHAWN	



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